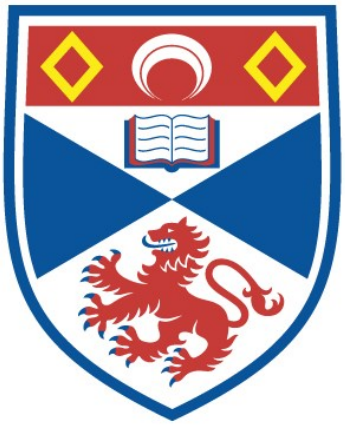
AN ANALYSIS OF SELECTED ASPECTS OF DEMOGRAPHIC CHANGE IN THE BORDER COUNTIES OF SCOTLAND, 1755-1961

Eve M. Soulsby

A Thesis Submitted for the Degree of PhD
at the
University of St Andrews



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Volume I

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Candidate's Statement and Declaration

I state that this thesis, "An Analysis of Selected Aspects of Demographic Change in the Border Counties of Scotland, 1755-1961," is the result of research undertaken by me. I was admitted as a research student under Ordinance General No. 12 of the University Court, St. Andrews, in October 1966 as a candidate for the degree of Doctor of Philosophy.

I further declare that this thesis has been composed by me, that the work of which it is a record has been done by myself, and that it has not been accepted in any previous application for a higher degree.

Supervisor's Certificate

I certify that Evelyn Margaret Soulsby or Coutts has fulfilled the conditions of the Ordinance and Regulations, St. Andrews No. 16, laid down by the University Court, St. Andrews, and is accordingly qualified to submit this thesis for the degree of Doctor of Philosophy.

ACKNOWLEDGEMENTS

This research study was carried out during the period 1966 to 1968 and 1970 to 1971 under the direction of my supervisor, Dr. K.M. McIver. It is to her that I wish first of all to express my gratitude for her encouragement, assistance and time so willingly given.

The research was initiated at the suggestion of the late Professor A.C. O'Dell, Department of Geography, University of Aberdeen, and I wish to acknowledge the help he provided just before his death in 1966 when the general approach adopted in this study was being formulated. It is a matter of great personal regret that he did not see the finished product, which deals with a topic and an area in which he showed great interest over most of his working life.

Acknowledgement is made to the University of St. Andrews for financial assistance in the form of an Honorary Research Scholarship awarded for a two-year period and to Mr. D.M. Devine, Deputy Secretary to the University, for his support of my application for this award. I would also like to thank Mr. J. Bibby of the Department of Statistics in the University of St. Andrews for his guidance in the multiple regression analysis which forms part of Chapter IV, and to Professor M.S. Beersman of the Department of Statistics, University of Missouri at Columbia, for helpful discussions and training in the use of statistical techniques. Mr. S. McDowall of the Department of Political Economy in the University of St. Andrews gave assistance in questionnaire design and valued practical advice on the field survey incorporated in Chapter V.

To my parents I wish to express my especial thanks for their constant encouragement throughout my educational career, for their financial support during my years as an undergraduate and for the many personal sacrifices made on my behalf. Their continuing interest in my post-graduate research has spurred me on to greater efforts, while their assistance during some of the field work in the Borders made the task in hand so much more enjoyable.

However, it is to my husband that I owe the greatest debt. He has spared no effort in keeping me appraised of recent publications and research and I have gained much valuable experience, secondhand, through his own research work. His quiet acceptance of disorder in our domestic life has been rivalled only by his patience in listening, at all hours of the day and night, to the disentanglement of the ideas and conclusions expressed in this thesis, whilst his advice, practical help and continual encouragement have considerably eased my path and removed many seemingly insurmountable obstacles.

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INTRODUCTION

> "People talk of depopulation of the Highlands," said the Duke of Argyll; "they never think of the depopulation of the Lowlands."
> (Hansard, 1891 ccccliv p. 250)

Three quarters of a century later, when the basic outline of this thesis was first conceived in 1965, this statement was equally valid and it was largely because of this apparent lack of interest that the Border Counties were selected as the area of study. Up to that time, research and public interest centred chiefly on the crofting counties — as a glance at the contents page of almost any volume of the Scottish Geographical Magazine will reveal. Yet the rate of depopulation in the Borders between 1951 and 1961 was considerably greater than the corresponding decline in the Highlands. The net percentage population change in Scotland during that period was +1.6%; the seven crofting counties recorded a net loss of 2.8%; the net loss in the Border Counties was 6.3%.

An investigation into this situation seemed overdue. An analysis of demographic factors associated with population decline was therefore initiated with a view to revealing the historical determinants of depopulation in the Border Counties. Although the analysis of population data is a field of research undertaken throughout the social sciences, the geographer's contribution lies

in his ability to interpret these data in relation to other spatial variables by appreciating the complexities of the environment within which population change takes place. The methodology adopted in this analysis is essentially tripartite, seeking to reveal the spatial and temporal facets of population change, the major population characteristics associated with it, and the dynamic forces in operation through time. This approach is, in effect, a procedure basic to all geographic research, namely an attempt to answer the questions Where? What? and Why? — and one which is therefore essentially similar to that suggested by Clarke (1965) and Zelinsky (1966). However, its application to a specific area, the Border Counties, requires the careful consideration of two further factors: which aspects of demographic change are most significant in the depopulation of the area, and which particular techniques are most useful in analysing them. Even without detailed investigation, it is obvious that the choice of these, especially the latter, will be governed by one all-important limiting factor: lack of adequate data. Therefore, a full discussion of and justification for the selection of each phenomenon analysed and each technique adopted will be developed as the investigation proceeds. In Chapter I, the physical and economic environments are examined, the former in its function as a resource-base and the latter in respect of man's development of the basic resources of the area through time. Chapter II deals with the problems of representing population distribution in cartographical form and attempts to explain the changing

features of the distribution as revealed by the method of mapping selected. The impact of burghal growth within the Border Counties is also discussed. The characteristics of the population are analysed in the third chapter with the purpose of explaining how and why the age, sex and occupational structures have altered in the Borders through time. Chapter IV is devoted to the study of population growth in terms of natural increase and migration. The migrational component, clearly established as the chief mechanism in population change, is subjected to as rigorous an examination as available data permit. Special studies in depth of one small burgh and three widely variant rural parishes complete the thesis. Thus the analysis will be conducted at two levels, the general, as portrayed by the Border Counties studied in relation to Scotland as a whole, and the specific, as depicted by the special study areas examined within the context of the Border Counties.

Contemporaneously with the initiation of this analysis, interest in the Border Counties was being generated elsewhere. Unknown to the present writer, a thesis entitled "Aspects of the Population Geography of the Eastern Border Counties, 1850-1967" was started by Miss J.M. Galt at the University of Edinburgh. At a higher level, the Secretary of State for Scotland was also concerned about the population problems in the Borders, spotlighting them in the Government White Paper "The Scottish Economy 1965 to 1970, a Plan for Expansion", published in 1966. The Central Borders area was then

selected for more detailed analysis by the Scottish Development Department, culminating in the publication in 1968 of a planning report entitled "The Central Borders, A Plan for Expansion". But for a prolonged period of ill-health and absence abroad, the current thesis would have been completed by 1969. This delay, thought detrimental at the time, has in point of fact allowed time for ideas to mature, additional experience to be gained and, most important of all, the incorporation and testing of conclusions drawn in the above-mentioned analyses. As a result, the current study, in addition to being areally and temporally more extensive, is complementary to, rather than repetitive of, previous research.

Contrary to the practice in the other studies, all four counties of the Eastern Borders of Scotland form the area for analysis in this thesis. From a purely practical standpoint alone, there is ample justification for this definition, since the Border Counties, comprising Berwickshire, Peebles-shire, Roxburghshire and Selkirkshire, is designated (in 1961) as a regional sub-division of Scotland by the Registrar-General. For example, much of the 10% sample data collected in 1961 — of specific interest here, the occupation and internal migration tables — are published for the Border Counties as a whole with no breakdown available for smaller units. The extent of the difficulties raised by attempting to examine a smaller area is well illustrated by the Scottish Development Department publication (1968) where the numerous appended tables refer either to their

study area, the Central Borders, or to the whole of the Border Counties, or to the counties of Peebles, Roxburgh and Selkirk only, depending upon the areal breakdown of the figures available to them. It would be invidious to elaborate on the problems posed by this situation and the confusion which arises where the area of reference has not been clearly stated — for example Vol. 2, pp. 69-70, Tables S.V, S.VI, and S.VII. Their reasons for omitting the Kelso district of Roxburgh are not wholly convincing, especially since much of the data upon which their projections are based refer to the entire county of Roxburgh. Furthermore, the inclusion of Castleton parish and the Langholm district of Dumfries-shire, both somewhat tenuously linked with the core area of the Central Borders, appears totally unjustified in view of the exclusion of Earlston, Berwickshire, a textile town not five miles distant from the proposed axis of expansion between Melrose and St. Boswells. Galt (1968), on the other hand, includes Berwickshire but omits the county of Peebles from her study area. It is suggested that, ideally, the study area would comprise the whole of the Tweed Basin. Unfortunately, the national boundary divides the lower part of the valley into two areas each of which, although similar in respect of their physical and economic characteristics, is enumerated in separate census publications. For reasons of comparability of data, the study area was best confined to that part of the Tweed Basin north of the Border. In addition, Northumberland had already been the subject of several

population studies undertaken by the Department of Geography of Newcastle University such as House (1952, 1954, 1956 and 1965), House and Dow (1954), and Edwards (1964). Meanwhile the Border Counties to the north had been virtually ignored. Further justification for regarding the four Border Counties as a population entity will emerge as the current analysis progresses. Distributional and demographic characteristics show great similarities while, in Chapter IV, it will be demonstrated that in terms of population movement greater affinity is found among the four Border Counties than between any individual county and its nearest neighbours outwith the area.

The time-period covered by the analysis is taken as the longest period for which appropriate statistics are available. Thus although it is possible to examine the population distribution over the whole period 1755 to 1961, consideration of the sex differential is not feasible until 1801 while age data are not comprehensive until 1851. There seemed little virtue in curtailing the analysis short of these imposed limits and no justification for the arbitrary 1850 starting-point chosen by Galt (1968). That maximum population was achieved in the Eastern Border Counties in 1851, as she repeatedly alleges, is shown to be totally false by Figure 1. Even accepting, for the moment, peak population as an adequate starting-point for a study of depopulation, this was reached for the whole of the Border Counties in 1891, for the Galt study area in 1881 and for the

individual counties of Berwick, Roxburgh, Selkirk and Peebles in 1861, 1861, 1891 and 1921 respectively. The question, however, remains: Is the period of maximum population the most appropriate point at which to begin such an investigation? If convincing explanations are to be found, it is contended that the analysis must go back in time to examine those factors causing the previous expansion and which then become mitigated in their effects, or cease to operate at all, thereby resulting in depopulation. Since demographic evolution is a continuum, there is no convenient break-point at which to begin the study. It is suggested, therefore, that the most acceptable temporal limitation is that imposed by availability of information.

It is customary to include a review of the pertinent literature when introducing a piece of extensive research. The omission of such a review here is a result of the lack of previous study. Other than the contemporaneous analyses cited above (Scottish Office 1966, Scottish Development Department 1968, and Galt 1968), there are but three major sources of reference on the population of the Border Counties, namely the Statistical Accounts, the Regional Plan for Central and South-East Scotland by Sir Frank Mears (1949), and the Scientific Survey of South-Eastern Scotland (British Association 1951). All of these cover a much wider area than the Border Counties but each includes factual descriptions of the demographic history of the area. Lesser sources of information are provided

in the main body of the text, as are references to relevant research which has been undertaken in other parts of Scotland and elsewhere. Since these references are numerous and since many recur frequently throughout the thesis, it was decided to cite only the name of the author and the date of publication in the text, the full reference being given in the bibliography. Footnoting is thus reserved for relevant supplementary comment.

Arguments in support of population geography as a viable systematic branch of the subject of geography have been conducted vociferously and convincingly by Trewartha (1953), Hooson (1960), Clarke (1965) and Zelinsky (1960 and 1966), and no further justification for this field of research is considered to be necessary. Clarke (1965) and Zelinsky (1966), however, point out the need for localised research on population phenomena while Taylor (1962) adds his plea for such study to be undertaken in Scotland, specifically suggesting "the demographic characteristics of areas of declining population" as a problem awaiting "the patient, long-term study of the academic approach".

Finally, a list of frequently recurring terms whose meaning might prove ambiguous, has been compiled. Each is used in this thesis as defined below.

Terminology

The Border Counties, throughout this thesis, shall refer to the four Eastern Border Counties of Berwickshire, Peebles-shire,

Roxburghshire and Selkirkshire as defined by the Registrar-General in the 1961 Census of Scotland. The suffix "-shire" shall henceforth be omitted from the names of these four counties. A problem arises, however, in that there are also towns and parishes bearing these names. When this occurs the town will carry the suffix "town" and the parish the suffix "parish", unless it is quite clear from the context which is intended. Thus Selkirk describes Selkirkshire, Selkirk town denotes the urban area and Selkirk parish refers to the parish of that name. A similar situation occurs in the cases of Peebles and Roxburgh. Where a town or village and a parish are found to bear the same name, as in Galashiels, Innerleithen, Melrose and many others, only the parish will be qualified by additional description. For example, Galashiels refers to the built-up area while the surrounding parish will have the suffix "parish".

The term "urban", ill-defined at the best of times (see, for example, Jones 1966, pp. 3-5), has been used to describe characteristics of the twelve burghs of the Border Counties whose burghal status has been established by the Registrar-General in the Census Reports. Throughout the thesis, the term "nation" refers to Scotland and "national" is synonymous with Scottish.

"Population" is used to denote a number of people. Where it is necessary to use the term in a statistical context, defined as the aggregate of elementary units, whether these units be people or not, the word is printed within quotation marks.

The common abbreviations, O.S.A. and N.S.A., have been used when reference is made to the Old Statistical Account of Scotland and the New Statistical Account of Scotland. The abbreviation T.S.A. has been adopted for the Third Statistical Account of Scotland currently available for Peebles and Selkirk but not published as yet for Berwick and Roxburgh.

CHAPTER I

THE PHYSICAL AND ECONOMIC ENVIRONMENT

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"Human populations react to their social and physical environment with a vigor and complexity that is probably unique among geographic elements" (Zelinsky 1966, p. 15). In any population study, it is essential therefore to appreciate the nature of man's environment and the spatial variations in the distribution of specific elements within it. The present concern is to provide an adequate background for the proper understanding of this population analysis. At no time is it possible to disentangle fully one element from others but in so far as the presence of population is itself a response to the potentiality of any environment and its persistence in a "healthy" state a reflection of its own capacity to react adequately within and with that environment, it is necessary to look at other elements, separately or in combination, in the light of a "resource-base" through time. For it is in the utilisation of the basic resources by all means open to the population that man himself survives and constantly modifies his environment. Thus it is justifiable to consider the physical environment — as an environment — as being basic, although even here it is important to appreciate man's capacity, through the application of technology,

constantly and continuously to modify the environment, particularly in terms of soils and to vary the product of that environment.

The two major productive occupations within the Border area over at least the last ten centuries have been farming and industry, both stemming from the pastoral economy of the Borders — namely the production and processing of sheep and their wool. Whether, given other circumstances, this area could have developed in any other way is speculation. The people, who were themselves the "Border" population, were in many senses conditioned by their physical and cultural heritage, each generation being the inheritors of what had gone before and, further, each having been increasingly influenced by contact with those around them.

Indeed, the location of the four Border Counties of Berwick, Roxburgh, Selkirk and Peebles, lying between Edinburgh and the English border, has had an important influence on the demographic development of the area. Although historically part of a buffer zone between the independent states of Scotland and England, the Border Counties provide natural routeways between the Central Belt of Scotland and the Tyneside and Solway Firth areas. Thus, in more recent times, the large population centres of Glasgow, Edinburgh, Carlisle and Newcastle have become readily accessible. It should be noted, therefore, that although this analysis is focussed upon changing population phenomena within the Border Counties the area cannot be regarded as an isolated unit but one affected by and

interacting with neighbouring counties and more specifically with the urban concentrations within them. This inter-relationship will be discussed more fully in Chapter IV with reference to the migration patterns.

In more precise terms, the area is bounded for the most part by the watershed of the River Tweed system. The bounding upland ranges, the Lammermuir, Moorfoot and Pentland Hills to the north and the Cheviots to the south, form an amphitheatrical rim enclosing the wide-floored basin of the River Tweed and its tributaries. This horseshoe of flat-topped, broad-shouldered uplands varies in height from 1,000' to over 2,500' with the greatest altitude arising in the west in the Broad Law (2,723') and Hartfell (2,651') summits. From here the land falls away north-eastward to a cliffed coastline between Cockburnspath and Berwick-upon-Tweed. Within the basin it is possible to distinguish three differing landscape units. In the west, the hill country has been deeply dissected by the River Tweed and its tributaries the Ettrick, Yarrow and Gala Waters. These valleys, varying in width from narrow gorges to broad terraced straths, are separated by high interfluves generally rising above 1,500'. In the Middle Tweed zone or dales area, the amplitude of the relief decreases and the broader, terrace-lined valleys of the Leader, Ale, Teviot and Jed Waters lie between elongations of low, rounded hills. Variety is added to this landscape by the abrupt intrusion of higher conical hills such as the Eildon and Minto Hills

to the north of the Teviot and Rubers Law and Black Law to the south. East of Kelso, the main valley broadens to form the low rolling countryside of the Merse. Here the land seldom rises above 400' and the volume of the meandering River Tweed is increased by the waters of several tributary streams from north and south. However, in this lower area, the course of the national boundary diverges from that of the watershed with the result that only the northern tributaries are included in the study area.

The causes of these landforms and the basis of soil formation and type are the two major elements of structure and climate. The summary of the geology of the area which follows is therefore included to demonstrate one of the significant elements of the resource base, for not only in a positive manner are the rocks and surface deposits the bases of soil formation, but in a negative way the absence of significant economic minerals such as coal and iron has been a strong contributing factor to the particular type of industry involved. Again it can be seen that this area lies between zones such as South Northumberland and Durham on the one hand and West Central Scotland on the other where the presence of such economic minerals, allied to other advantages, has resulted in quite different patterns of population distribution, characteristics and movement.

The rocks of the area, which have all been folded and faulted, belong to the Palaeozoic era, ranging from Ordovician through

Silurian and Devonian to Lower Carboniferous. Silurian grits and shales form the uplands in the north and west and extend to the coast at St. Abb's Head by way of the Moorfoot and Lammermuir Hills (see Walton, 1955). The Cheviot Hills to the south-east are composed mainly of andesite lavas of Devonian age. Within this rim, the western end of the Merse depression (east of Hawick and Melrose) is floored with Devonian sandstones and conglomerates while the eastern part north of the Tweed is formed of carboniferous limestones and calciferous sandstones. Between these two, i.e. in the centre of the Merse depression, lies a great mass of extensive basalt lava of Devonian age: within these lowland areas of Devonian sandstones and lavas, there are to be found a large number of isolated hills and ridges resulting from basalt and dolerite intrusions during Devonian and Carboniferous times. These are laccoliths and sills, for example the Eildon Hills, Black Hill and White Hill, dykes trending north-east between Melrose and Selkirk, and necks such as Black Law, Linton Hill and the Minto Hills.

Various periods of folding, fracturing and uplift followed by rapid erosion and dissection during Tertiary times helped to mould the landscape which existed prior to the onset of the Pleistocene ice age. At the time of maximum glaciation the Southern Uplands were covered by an ice sheet which completely buried the highest hills. For this reason and that of the comparatively recent deglaciation of this area, much of the detail of both erosive and

depositional forms must be due. From the areas of snow accumulation in the west, the ice moved north-eastwards down the Tweed valley to the coast where it was deflected south by the Scandinavian ice sheet which then occupied the North Sea basin. The pre-glacial valleys were infilled with thick accumulations of boulder clay which, in some places, diverted rivers from their former courses (Linton 1933), as may be seen between Jed and Oxnam Waters near Jedburgh. In lower Tweeddale there is a striking development of drumlins and the retreat of the ice is marked by a succession of moraines especially evident between Greenlaw and Duns. During the final retreat of the ice, fluvio-glacial sands and gravels were spread over the lower areas. After the disappearance of all the ice, the rivers cut down through the glacial debris and often into bedrock, and in major valleys formed alluvial terraces at successively lower levels. In addition to river alluvium there are small deposits of lacustrine alluvium associated with existing or former lochs. According to the Old and New Statistical Accounts, many of these deposits were underlain by marl which was often used for agricultural improvements.

The amphitheatrical nature of the area opening to the sea in the east but whose prevailing winds are westerly must on the one hand allow the penetration of sea influence in the east retarding grass and crop growth in spring and autumn, and on the other reap the benefit of upland areas which, particularly in the west, are bound to be the recipients of moisture from Atlantic winds.

Temperature records for this area are conspicuously lacking and are confined to stations in valleys. The figures for four stations within the counties are given below in Table I:-

TABLE I.1: Average Means of Temperature for the Period 1906-1935

Station	Altitude	Jan. °F(°C)	July °F(°C)
Kelso, Roxburghshire	195'	37.8(3.2)	58.3(14.5)
Marchmont, Berwickshire	498'	37.3(3.0)	57.1(13.9)
Hawick, Roxburghshire	537'	36.8(2.7)	56.9(13.8)
West Linton, Peeblesshire	770'	35.0(1.7)	56.0(13.3)
Gala Uplands, Selkirk (est.)	800'	34.8(1.6)	55.9(13.3)
Lammermuirs, Berwicksh. (est.)	1400'	34.3(1.2)	54.1(12.2)

Source: The Land of Britain, ed. L.D. Stamp, Parts 14 (1941), 24, 25 and 26 (1946).

The temperatures for other higher areas, however, may be roughly deduced by using the lapse rate of 3°F per 1000'. This means that at 1500' the mean January temperature would be about 34°F(1.1°C) and the July mean temperature approximately 54°F(12.2°C). 1500' is the lowest level at which severe exposure to high winds and evaporation are added to the lower temperature conditions induced by altitude, since it is at this level that the lowest summits of the upland area are found. It is also the approximate upper limit of tree growth in Scotland. The growing season, determined by the number of days per year during which the daily mean temperature is more than 42°F(5.6°C) shows considerable variation. This is set out below.

TABLE I.2: Length of Growing Season

Station	Altitude	Growing season in days
Berwick-upon-Tweed	76'	238
Kelso	193'	219
Marchmont	498'	208
Hawick	537'	203
Gala Uplands	800'	195
Lammermuirs	1400'	175

Source: Ragg (1960) and Muir (1956).

When these figures are compared with the land utilisation map (Stamp 1941, 1946), it may be seen that the main arable farming is carried out where the growing season is longer than 210 days, while mixed and marginal arable farming requires 185 to 200 growing days and hill farming with little or no arable land is confined to areas with less than 185 growing days.

The most outstanding feature of the rainfall in the area is the low annual value for Lower Tweeddale of about 25", comparable with that of South East England. The amount rises sharply, however, towards the Western Merse where there is over 30" east of Duns while in the upland rim of the Tweed valley the average precipitation increases to between 70" and 80" per year. The effect of relief on the annual precipitation is of paramount importance in this region where the prevailing airstream is south-westerly. Thus the upland areas to the south and west shelter the Merse and tributary valleys with such efficacy that there may be as much as 20" difference in

rainfall, over a few miles between hill-tops and adjacent drier valleys. The following table gives an indication of variation in precipitation with height:-

TABLE I.3: Average Rainfall for the Period 1881 to 1915

Station	Altitude	Total Precipitation
St. Abb's Head, Berwickshire	224'	23.60"
Coldstream, Berwickshire	94'	25.63"
Hutton, Berwickshire	240'	25.46"
Kelso, Roxburghshire	193'	26.03"
St. Boswells, Roxburghshire	260'	28.02"
Galashiels, Selkirkshire	416'	31.75"
Marchmont, Berwickshire	498'	32.18"
Selkirk, Selkirkshire	670'	34.79"
Hawick, Roxburghshire	537'	37.63"
Teviothead, Roxburghshire	950'	55.00"
Gameshope Loch, Peeblesshire	1860'	70.60"

Source: The Book of Normals, Section V(Meteorological Office 1924).

The distribution of rainfall is fairly uniform throughout the year. The lowest rainfalls, however, are experienced in February, April and May when rain is needed for the germination of young crops, while the wettest months are in October and the harvest month of August. Snowfall is often heavy, with snow lying at higher elevations for 20 to 30 days, which may result in disastrous losses in a sheep-farming area such as this. It seems likely, therefore, that climatically "bad" years, which are all too frequent especially in Berwickshire with its crop failures, its low average rainfall and

its unpredictable snowfall, may lead to out-migration.

The studies of the Border soils by Ragg and Futty (1967), Ragg (1960) and Muir (1956) in the series of memoirs produced by the Soil Survey of Scotland provide a wealth of detail for Berwick, almost the whole of Roxburgh and the eastern portion of Selkirk, whilst the county of Peebles is almost entirely unsurveyed at present. At Great Soil Group level of classification the following major soil groups are recognised as being broadly co-incident with the physical sub-divisions.

In the Merse and the lower Whiteadder and Eyewater valleys the tills derived from Lower Carboniferous sediments and lavas, Devonian sediments and Silurian grey wackes have been aligned north-east to south-west in drumlin formations. Imperfectly drained Brown Forest soils with gleyed B and C horizons are found on the upper slopes, giving way to poorly drained gleys in the hollows, which, in extreme cases of impeded drainage, leads to the formation of basin peat. For much of the area the pattern of drainage class relationships is so complicated that it necessitates large portions being mapped as a soil complex.

The valleys of Teviotdale, Tweed-dale, Ettrick Water, Yarrow Water and Lauderdale are floored with alluvium which is flanked in many cases by deposits of fluvio-glacial sands and gravels associated with the retreat of the late Pleistocene ice sheets and particularly the valley glaciers. These deposits give rise to freely drained

Brown Forest soils of low base status. Away from the valley floors, freely drained Brown Forest soils of low base status are developed on frost-shattered and solifluoted greywackes, shales and Devonian sediments. These soils owe their free drainage status to moderately steep slopes and usually support upland grazings.

On the uplands at moderate elevation (below 1000 feet) tills of fine texture on flattish or gently sloping sites give rise to poorly drained gleys. This soil group finds its best expression on the uplands between Galashiels and Hawick, the Duns uplands south of the Whiteadder Water and on the eastern Lammermuirs; where slopes become steeper, the drainage conditions are altered and a Brown Forest soil with gleyed B and C horizons is more usual on these tills, which are derived from Ordovician greywackes and shales and Silurian sediments. In places, especially around and to the east of Selkirk, the micro relief features produced by iso-clinal folding of the Ordovician strata makes for another area of complex soil inter-relationships.

In the high uplands, the role of parent material in the soil pattern assumes a lesser role. Here the bedrock is usually frost-shattered, and solifluction deposits rather than tills are usually found. A deterioration of climatic conditions is reflected in the soil pattern. Higher rainfall and lower evaporation combine with topographic features to produce one of three major soil groups. On flattish or gently sloping sites where drainage is impeded by slope conditions, gleys are found which have a peaty surface horizon

(2 inches to 12 inches in thickness) owing to the decreased rate of decay of organic matter in the cooler, wetter conditions which prevail. On steeper slopes with a mantle of soliflucted debris, peaty podsols are found. Here the base-deficient rock type and lack of mixture of rock type which one finds in the tills at lower elevation, the dominant vegetation of callunetum, nardetum or molinietum, allied to the higher rainfall, leads to a more severe degree of leaching. Thus podsols with acidic peaty O horizons are normal. The high flat summits of the area — usually above 1600 feet — are covered with hill peats, that is with organic accumulation of greater than 12". It often has a depth of 4½ to 6 feet and is composed of calluna vulgaris, eriopherum and sphagnum species. It is most noticeably developed on the flatter, broader plateaux developed on Carboniferous rocks and on the higher reaches of the western Lammermuirs. On steep slopes everywhere one finds that gravitational influences are dominant, with soils being kept in a permanently immature state, e.g. NT 445465, whilst screes and solid rock outcrops near the Border in the Cheviots show a patchy development of organic material over loose lava blocks.

As mentioned above, no detailed soil survey has been published for the western Selkirkshire and Peebles-shire region. It is therefore not possible to go further than certain basic assumptions derived from the detailed surveys farther east. In western Selkirkshire the topographic pattern is one of uplands deeply dissected by

the Ettrick and Yarrow Waters. Here one might expect the topographic sequence of hill peat/skeletal soil merging through peaty podsols and skeletal soils to Brown Forest soils and alluviums in the narrow valley floors. In Peebles, however, the relief pattern shows all grades of high upland and moderate upland surfaces merging by way of lower, gentler slopes of Brown Forest soils, with the more open valley form of rivers such as Eddleston Water and the Tweed where drainage is liable to be impeded. Therefore one might expect to find within the county the complete range of Great Soil Groups which have been outlined above.

It would appear from material interpreted by Piggot (1949), among others, that agriculture was undertaken in the Border Counties as far back as prehistoric times. Cultivation terraces used by the people who occupied the forts such as that atop the Eildon Hills may still be seen in the hill country.

Later, during the Middle Ages, the Church founded many establishments in the Tweed Valley and had great influence on the agricultural activities. The abbeys of Dryburgh, Jedburgh, Kelso and Melrose were founded about the twelfth century and their records show that large flocks of sheep were kept on low ground and the Cheviot Hills and that the export of wool was a valuable source of revenue to the whole region. This, together with the development of Berwick-on-Tweed as a seaport by David I, led to much progress in all fields and by the end of the thirteenth century the Tweed Valley was the wealthiest part of Scotland.

The decline which followed was due to a combination of political, geographical and economic factors. It began with the attempts of Edward I to subjugate Scotland, and this prolonged period of hostility did not end until the Union of the Crowns in 1603. Because of its position on the national boundary, this region came under heavy attack with accompanying plundering and burning. In addition, Berwick-on-Tweed was finally ceded to England in 1482 and the main outlet for the Tweed basin was lost. It is not surprising that agriculture suffered and presumably the population dwindled as well. Instead of improvements in farming, the acreage under cultivation decreased since there was little incentive to farm the land in view of the devastation which took place and the farm worker had to turn soldier to defend himself. Between the Union of the Crowns in 1603 and the Act of Union in 1707, the area remained economically stagnant since the border was a fiscal barrier. Furthermore, the roads were extremely bad and difficulty in reaching a market was an important factor in the agricultural apathy of this period.

Prior to the eighteenth century there is little or only patchy information about the agriculture of the Border Counties but at the end of the eighteenth century there is a comparative wealth of material such as the agricultural accounts of Douglas (1798), Johnstone (1794) and Ure (1794), as well as those contained in the Old Statistical Account (1790). Much light is also shed on

eighteenth-century Scottish agriculture by Handley (1953 and 1963).

The Agrarian Revolution, involving the abolition of run-rig farming and the enclosure of fields, did not occur until after the Union of Scotland and England in 1707. However, it was peculiarly fitting that the lower part of the Tweed Valley, after its early wealth followed by the ravages of the extended wars, should be the first to benefit from the new ideas of the Agricultural Revolution and become the cradle of Scottish improved farming. As early as 1730, Swinton of Swinton in Berwick drained, marled and enclosed his estate; from 1746, Lord Kames introduced turnips, potatoes, clover and artificial grasses in rotation on his land and published "The Gentleman Farmer", thus helping to spread the knowledge of improved farming; in 1754, Dr. Hutton of Sleighouses near Duns went to Norfolk to study the new farming methods there and returned with a Norfolk plough and ploughman who worked with such success that the rent of the land rose from 3/- to 21/- per acre; in 1737, Andrew Rodger of Cavers made the first winnowing machine used in the United Kingdom; and in 1764, James Small of Ladykirk made the now famous two-horse swing plough.

The further one moves away from this Merse heartland of improvement and invention and into the sheep pastures of the higher land, the longer it took to introduce these improvements; but by 1800 great progress had been made in separating the arable land from the hill pasture by stone dykes and on the arable land itself by

draining, liming, embanking and the planting of shelter belts. Together with this new interest in farming along improved lines came the Napoleonic Wars of 1795 to 1814, with their attendant increase in demand for agricultural products enabling full advantage to be taken of the advance in methods. With increased prices, there occurred an increase in acreage of arable land even above 1,000 feet in some parts (Stamp 1941), resulting in additional labour requirements. However, farm rents also increased and, after the war, the usual slump in trade and an accompanying depression in agriculture set in, resulting in the amalgamation of farms and attempts to reduce the costs of labour. This cost reduction process was carried out partly by converting large tracts of arable land into sheep pasture and partly by an extension in the use of labour-saving equipment. It was at this time that a decrease in the number of farm workers and servants occurred although the total population of the area continued to expand for several decades.

The situation was partly saved by the coming of the railway. Although lines were not prolific in the area, the railway gave speedy access to a much wider market. Furthermore, the farmer could buy his needs from additional sources. Among these supplies were artificial manures such as guano (introduced in 1841) and bone manure. Thus grassland was improved and young cattle were brought to the Mersey for fattening from Northumberland and Ireland.

During the period 1850 to 1880 this boom in agriculture

continued in all four counties. More land was put under the plough and cultivation and improvement was extended even further up the hillsides than before. The government of the day helped in this by granting long-term loans at low rates for improvements such as draining and fencing in order to ensure cheap food for industrial areas. Most of the work was done by Irish labour which was then abundant and cheap. However, this boom was short-lived, for in the 1880s the downward trend began with a series of poor harvests and was accelerated by the import of cheap grain from abroad. Prices decreased rapidly and wheat, which in 1870 had realised 7/- a bushel, was selling for only 3/- a bushel by 1895. The immediate reaction of the farmers was to reduce costs by curtailing labour to the absolute minimum. This resulted in a rapid decrease in rural population. In addition, smaller farms were amalgamated once more and put under pasture which led to further depopulation of the landward areas. This rapid decline in population is best portrayed by Berwick (Fig. 1) where, by 1911, the population had fallen to a lower level than when the first census was taken in 1801. Although the 1914-1918 war brought a brief period of agricultural prosperity, this was only a temporary arrest in the general decline and the depression in farming during the 1920s and 1930s was common to all the agricultural areas of Britain. The pattern was repeated yet again with the advent of the Second World War. Thus has emerged the present character of agriculture in the Border Counties, although since 1945 conditions for the farmer have been aided by Government

action.

Today there are three distinctive systems of farming, with sheep as the common factor in them all. On upland farms, those above 750', the main enterprise is the breeding and rearing of ewe lambs and consequently the growing of arable crops is chiefly undertaken for the winter feeding of stock, although a limited amount of cash cropping with oats, barley and potatoes is possible. The sheep are sent to the markets at St. Boswells and Hawick. Since the grazing by sheep cannot keep pace with the growth of grass, it is essential to have stocks of beef cattle in the interests of good sheep husbandry. In recent years the numbers of cattle have increased but the potential is far from being realised since capital is needed to lay on extra stock, more winter food must be stored, and a larger labour force is required for the additional work involved.

The type of farming on the hill farms, transitional between upland and low-ground farms, follows a similar pattern to that of the upland farm, but the grazings are of better quality and free from the commoner diseases which affect sheep. Cattle are also reared here, encouraged in part by the subsidies available for the breeding of beef cattle in hill areas. Animals are often wintered out but again a limited acreage is devoted to the production of hay, oats and turnips for additional feeding and some hill farmers have a low-ground arable farm as well which solves the wintering problem.

The main feature of these two systems is the formation of a

reservoir of sheep and cattle to meet the needs of the low-ground farmers within the Border Counties and beyond. The livestock marketed is carefully graded and is of high quality and reliability, and therefore much sought after by buyers. The low-ground farms, those below 400', concentrate on the production of fat and store lambs for export outwith the area. Cattle are also fattened in the area, having been brought in from the hill and upland farms, Ireland, and the North of England, and their numbers are rapidly increasing. These low-ground farms are suitable in terms of soil, elevation and climate to grow a wide range of crops, not only fodder such as turnips and oats, but also cash crops such as barley, oats, wheat, potatoes and sugar beet.

In a region where the agricultural emphasis falls so heavily on sheep, it is not surprising to find that the chief industry is the manufacture of woollen goods. Although wool must have been the basis of a home industry here, as in other parts of Britain, from very early times, the first mention of textile manufacture in the Border Counties is a reference at the end of the sixteenth century to two wauk mills at Galashiels (Hall 1898). This coincided with an Act of Parliament passed in 1587 to encourage the settlement of Flemish craftsmen and the employment of Scottish apprentices.

During the seventeenth century the number of mills increased and the earliest Corporation of Weavers in Scotland was founded in Galashiels in 1666. With government help under the Act of Union, and financial aid from the Board of Manufacturers, Gala Blues and

later Gala Greys became one of the mainstays of the rapidly developing industry. Nevertheless, the manufacture of woollen cloth was mainly organised on a cottage industry basis until 1790. In Hawick in that year a Quaker, William Wilson, began operating a stocking frame and hosiery was made by Baillie Hardie, while a year later George Mercer brought various types of spinning and weaving machinery from Leeds to Galashiels. Immediately following this introduction, the tweed trade received an unexpected boost through Sir Walter Scott, who set the fashion for checked tweed trousers. Originally the checks were black and white, varied only by the size of the check, but soon brown and then other colours were tried. After the checks, twills in new combinations of colours followed. Each change gave fresh impetus to the trade and Scottish fancy woollens became the fashion.

The supply of local wool soon proved inadequate in spite of the increasing development of pastoral farming and, in 1834, fine wool was imported first from the continent and then from Australia, New Zealand and South America. As a result many new Border mills were established about the middle of the nineteenth century. In 1851 there were 72 tweed factories and in 1862 82 mills existed, with their geographical distribution spreading out in 1850 from Galashiels to Selkirk, Peebles and Jedburgh and thereafter to Walkerburn, Innerleithen and Earlston. There was a similar increase in interest in the hosiery industry of Hawick during this period where in 1791 there

were 12 hand knitting frames, while by 1844 this number had risen to 1200. At the beginning of the Industrial Revolution, therefore, the Tweed Valley was already producing specialised woollen goods. Such specialisation helped the region to hold its own in face of the increasing competition from the newly established and rapidly growing industrial areas of the Pennine flanks. However, while the latter had the advantage of coal for steam power at hand, the Tweed basin had no such natural resource, and even as late as 1868 the ratio of water to steam horse-power was 263 to 117 although Bremner, writing in 1869, gives the impression that conversion to steam power was then general (Smith 1949, p. 432). In addition, the economic structure of the Borders industry is somewhat different from that elsewhere in Britain since the integration of spinning and weaving on the same premises is much less developed. Of a sample 29 mills, 8 practise both spinning and weaving, 6 are spinners only, and 15 are weavers only (Smith 1949, p. 432). It may be that this departure from normal practice is connected with the character of the tweeds woven from dyed yarns of considerable variety and with the supply of yarn to the hosiery and "making-up" industries.

The impact made on the demographic pattern by this increase in industrial activity in the mid to late eighteenth century may be seen in an increase in the population of Selkirk of some 80% between 1871 and 1881.

The Tweed Valley increased its share of the woollen industry

consistently up to 1931 and in those later years woollen technical colleges were founded in both Galashiels and Hawick. However, since then the fortunes of Border woollens have fluctuated. Continuing specialisation has taken place in the area and one might instance the Galashiels-based firm of Bernat Klein which follows the trends of fashion with its high-quality knitting wools and haute couture knitting patterns and clothing. Another feature of the industry has been the amalgamation of mills and the take-over of individual firms by larger organisations. In other mills, the production of woollen goods has been abandoned. For instance, the introduction of the manufacture of artificial silk at Jedburgh was an attempt to alleviate the effect of the post-First World War depression, with its accompanying lack of demand for costly high-quality products. More recently, former woollen mills now house mid-twentieth century types of manufacture such as electronics and plastics.

There has been development of industry in the Border Counties other than that of textiles. A limited amount of associated manufacture has been established, such as the making of dyes. Other minor industries include those associated with agriculture such as the making of agricultural machinery, and there is a small paper-mill at Chirnside in Berwickshire. However, it is the textile industry and its development that yields many of the clues to the causes of change in size, distribution and structure of the population of the Border Counties, especially in the late nineteenth century.

CHAPTER II

SPATIAL ANALYSIS OF POPULATION DISTRIBUTION AND CHANGE

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The first concern of the population geographer must be the location of population numbers. However, as Zelinsky (1966) states, "the simple 'where' of things cannot be accepted as a sufficient definition of the scope and purpose of population geography". To be analytical, the geographer must look for inter-relations and correlations of variables through space because it is the interaction of such features that gives specific places their special characteristics. Zelinsky (1966) further points out that ideally the population geographer would look to the cartographer for maps and to the demographer for adequate accounts of their genesis while he, the geographer, interpreted them in their geographical context. This may well be the case in certain areas where, over a limited period of time, sufficient data is available in the form of base maps and population statistics to allow the cartographer draughtsman to produce an accurate map of population distribution and density. But in many areas, and particularly in the Border Counties where so little work has been done and, further, in a study where the time span takes the researcher back into a period where none of the data is necessarily either totally reliable or available in the desired

form, this ideal cannot be realised. It is, therefore, an essential task for the geographer to devise a system of mapping which will enable time, space and number to be adequately represented as a basis for further and deeper analysis.

The maps which accompany this chapter are the results of much time-consuming effort but the methods devised should be susceptible of application to any other or further work which presents a researcher with comparable problems.

1. The Choice of Mapping Technique

The first problem encountered was that of selecting a valid method of representing the distribution of the population in the context of the Border Counties. This was resolved by evaluating each of the various techniques which have evolved over the years. Since the method of density representation used here is a variation on that used by de Geer (1922) in one of the first maps of rural population density, it is thought worth while to include a review of those methods which have been considered and rejected. There were several conditions that the map had to fulfil. If possible, it had to show the actual number of people within the given area, the density of the population, and the grouping or arrangement of that population. Secondly, it was necessary that the same techniques could be used over a large time-scale — 210 years — meanwhile

making as much use as possible of the scanty data available for the 1750s as well as the more sophisticated statistics of the 1960s. Thirdly, covering an area of some 1730 square miles, the map must be as detailed as is consistent with the portrayal of an overall picture of the Border Counties.

By the mid-1930s, two methods of representing population distribution were in general use. These were the dot method developed to a considerable degree in Scandinavia and the United States, and the choropleth method as used in Great Britain and Europe. These two methods vary considerably as to their applicability, their usefulness and their purpose.

The dot technique is the simplest way of representing the distribution of absolute population. The smaller the dot value, the more accurate is the population map, since if the value of the dot is too large, sparsely populated districts will not be represented at all, and if too small, the dots will coalesce in densely populated areas. One way to overcome this difficulty is to employ two sizes of dots or to use a uniform dot to represent the distribution of population in all areas except towns of more than a defined population and proportional circles for these towns as developed and used by de Geer (1922). Attempts have been made over the years (for example, see Monkhouse and Wilkinson (1952), pp. 21-23) to refine the dot technique for wider use, but the basic principle remains unaltered. This method gives an accurate picture of the location of

population provided that the dot represents a sufficiently small number of persons. It can be used over a representative time-scale given the availability of adequate base maps for several points in time. This method would also allow population density to be depicted although to obtain statistical man/land ratios, laborious counting and calculation is required.

The choroplath map was first used, as far as can be ascertained, in a map prepared for the Second Report of the Railway Commissioners for Ireland in 1837 by H.D. Harness. This method involves the consideration of land areas in conjunction with population totals. The simplest way of computing this is to calculate the man/land ratio for enumeration districts, i.e. parishes in Scotland; but, in that only a limited range of shading is practicable, only certain categories of population density can be shown on a map. An attempt to obviate this was the construction by Alexander and Zahorchak (1943) of a series of maps depicting densities of total population, rural population and farm population. Their calculations were speeded by the use of a nomograph and relevant density groupings were revealed by a dispersion graph. However, use of this method is limited to countries with this type of census data available. Areas, too, present something of a problem over a large time-range in that parish acreage returns are not accurate in the early censuses and changes in parish boundaries give rise to anomalies between the acreage of parishes at different points in time. Various refinements of the

choroplath map have been devised since it is obvious that population densities are not homogeneous throughout enumeration districts. The dasymmetric technique devised by Wright (1936) where densities are calculated for inhabited areas only, is one way of avoiding the limitations imposed by enumeration boundaries. By studying large-scale topographic maps and/or aerial photographs, supplemented by field observation, areas of relatively homogeneous density are plotted with no regard for administrative divisions. An ingenious method for converting a dot distribution map to a dasymmetric population density map was suggested by Prothero (1960). He superimposed a grid over the dot map, calculated the population density for each square and shaded these accordingly. While the dasymmetric method has the advantage over the dot map of providing actual figures to which one may refer, it gives a more generalised picture.

This technique was taken a stage further by Barnes and Robinson (1940) who, presumably unknown to them, used the same formula as Sidenbladh (1880) in an attempt to refine the density map still further by measuring the spacing of the population. For areas of dispersed rural population, they based their technique on a dot map where each dot represented a farmhouse, and produced the formula

$$D = 1.11\sqrt{\frac{A}{n}}$$

where D is the distance of a farm from its six nearest neighbours, A the total area, and n the number of farms. They found the resultant values to be accurate to within 4%. The constant 1.11 was

later corrected to 1.07 by Mather (1944). These values were represented by isarithms, sometimes called "population contours", giving a much more detailed representation of density than does a choropleth map. As the authors conclude, however, there are limitations in that it is applicable only to areas of dispersed rural settlement and its reliability depends on the evenness of farmhouse distribution and the size of the areal unit. The reliability of the drawing of isarithms is discussed by Blumenstock (1953). Alexander (1943) furthered the solution of the problem by suggesting the combination of the "dot" map with the isarithmic. He states that isarithms, which denote density, are best for dispersed population since the number of people in the area can be read directly from the map and they show graded transitions rather than the abrupt density changes of the crude density map. However, isarithms cannot be used for determining the actual population of an urban unit and he suggests that "dots", by which term he seems to intend proportional circles, be substituted. This technique had been used previously, however, by Bollinger (1930).

Other methods of mapping population density more realistically include the ratio of population to cultivated land. Problems abound here, too. In the first place, not all agricultural land is of equal productive value. In an attempt to overcome this obstacle, Clarke (1965) gave weighting to the various types of land use. He suggested that all arable is of uniform value — this is a fallacy in

itself — that orchards and gardens are three times as valuable, that meadowland is two fifths of the value, and pasture one fifth of the value. It is doubtful whether calculations of this sort throw more light on the problem of comparison of population densities as the value of agricultural land varies enormously. In a country such as Britain where less than 5% of the native population is agriculturally employed (Clarke 1965) such an index is meaningless. A more realistic index would seem to be to tabulate the ratio of only the agricultural population to cultivated land. However, should this number include only persons actively employed in agriculture or should it take account of their familial dependents or of all those who live in rural areas?

The notion of economic density of population has been propounded by Simon (1945) when he related population density to production capacity and also suggested relations to the general index of production, of consumption and of all economic activities. However, these are complicated formulae which are of use for comparisons in one country over a limited time period, and Clarke (1965) suggests that, this being so, the concept of density has passed beyond the scope of geography. Clarke (1960) proposes that persons per room is another significant index of population density which has more validity for industrial and urban populations than a man/land ratio, especially in these days of vertical expansion within towns. However, while this may give some measure of physical overcrowding, although even this

may be invalidated since most of such statistics as are available ignore room size — a relevant factor surely with the current trend to open plan architecture — this was not considered to give any indication of population distribution.

However, the agricultural, economic and housing densities are limited in application to the brief period of time for which statistics are available. In addition, with reference to all attempts to refine density figures, Duncan (1957) states that by basing the figures on "net" rather than "gross" area, there is considerable indeterminacy in the notion of "net-ness".

Other techniques for showing population distribution and density have developed from analogies with physics and depend upon the central tendency of population distributions. This centrographical method was first developed by Svietlovsky and Eels (1937) and has been used as a basis for dispersion and potential population mapping. These types of maps are based on one of a number of centrographical measures which include the mean centre, the median centre, the modal centre, the harmonic mean centre and the geometric mean centre. These measures are most useful per se in the development plans of emergent nations but may also be used in regional development plans to good effect, although notably omitted by the Scottish Development Department (1968). Standard distance deviation, found by dividing the mean centre $\Sigma(pr)^2$ (where p equals the population within a segment of area and r is the distance of the mid-point of the segment to the point in

question) by the total population (P), then by taking the square root of the resulting mean square, i.e.

$$s_r = \sqrt{\frac{\Sigma(pr^2)}{P}}$$

was first developed by Stewart and Warntz (1958) as the dynamical radius of a population, measuring, for example, the expansion of the population of the United States. Mean distance deviation, as used by Warntz and Neft (1960), is determined by dividing the median centre by the total population, i.e.

$$md_r = \frac{\Sigma(pr)}{P}$$

and measures the arithmetic mean distance of individuals from the median centre, represented on a map by isolines of aggregate travel distance. The harmonic mean distance deviation,

$$h_r = \frac{P}{\Sigma(p/r)}$$

may be used also and has been discussed by Stewart (1948) and Warntz and Neft (1960). The idea of population potential mapping was introduced by Stewart (1947) and has been expanded over two decades in Stewart and Warntz (1958), Stewart and Warntz (1958a), Stewart and Warntz (1959), Warntz and Neft (1960), and Warntz (1964). The influence of any concentration of population from one part of the earth to another may be expressed as the number of people in that concentration divided by its distance to the spot at which the potential is being assessed. This potential may be mapped by means

of isopleths with an interval expressed in terms of persons per mile. The accuracy of these maps is increased the larger the number of control points and while the first map by Stewart (1947) was computed for twenty-four control points, by 1958 (Stewart and Warntz) one hundred and eighty-five control points were used with the help of a computer. It is hoped to produce an even more detailed map based on twenty thousand control points (see Warntz 1964). Population potential is very useful in correlating cultural, social, economic and even political factors with population concentration, given sufficiently detailed statistical information for the area under study.

Having reviewed these various methods of expressing population distribution and density, none of them appeared appropriate to the particular problems of data and time-span posed by this primary analysis of the population geography of the Border Counties. This is not to say that many of these methods could not make useful contributions to further detailed study once the primary analysis is complete: it should be noted however that population potential serves best on a macrogeographic scale and thus cannot be used effectively in this microgeographic study of the Border Counties.

After consideration of all these techniques it became apparent that the dot method would satisfy most closely the requirements for the construction of basic distribution density maps over a large time-span, especially since the Border Counties have, for the most part, a rural population. This conclusion is supported by a number

of geographers. Wolfe (1928) stated that for the purposes of visual comparison of densities and for locating on a map the population where it actually is, instead of spreading it uniformly over a unit area, dot maps are generally superior to other devices. Fawcett (1935) argues that since population has a discontinuous distribution, it can be accurately represented only by some discontinuous markings on a map such as dots and that the dot method is capable of "a nearer approximation to a true representation of both the actual numbers and the grouping or arrangement of the population". Alexander (1943) considered that the dot map is unexcelled for the indication of numbers and patterns of population spread, provided that it is refined to the point where each dot represents a house. Some instances of the dot distribution map being used recently for various points in time and on various scales include Walton (1950), who used the poll tax returns of 1696 for constructing a dot map of North East Scotland where one dot represents five people; Haughton (1959) in a field study of 25 square miles in the Mullet of Mayo using one dot to equal ten people; the dot distribution map of Scotland for 1961 produced by the Glasgow Department of Geography where one dot represented twenty-five people; Gordon (1964) and Robertson and Wood (1966) explain the placing of the dots on this map, "geometrically according to the buildings pattern"; Robertson (1967) in a study of South West Argyll using one dot to represent ten people. To this list of advocates of dot distribution mapping for population a final name must be added, that of the late Andrew C. O'Dell. O'Dell (1935) thought

that the dot map in its utmost form of precision, viz. the dot representing one inhabited building, first used in his own study of the Shetland Islands (1933), was the most useful for the research worker since the site of the building is a fixed point, showing critical distributions which can be readily correlated with geographical controls. He made further use of this method in 1953 in mapping a variety of distributions from Roy's maps (1755), though not one of population. However, he stated that this map together with Webster's First Enumeration of the People (1755) "permits the preparation of a detailed population map of Scotland" for 1755. In April 1965, two months before his death, he still considered the dot map to be the ultimate for research work and it is largely due to his advice and encouragement that this thesis and, in particular, this series of dot distribution maps was embarked upon.

2. The Construction of the Dot Distribution Maps

It would appear from the previous research work discussed above that the most significant value to give each dot was five and that the dots should be placed as closely as possible to inhabited buildings. A dot value of five is further justified by the figures in Table II.1, which show for each county the average number of persons per inhabited house at each dot distribution map date since 1821. No corresponding figures are available for 1755. It can be seen

that, at the two earliest dates, the population will be under-represented given a dot value of five whilst in the twentieth century it will be over-represented. However, taken over the whole period from 1821 to 1961, the mean average number of persons per inhabited house approximates to five. The problems encountered in producing these dot distribution maps, together with the method used to compensate for this under- and over-representation, are discussed later in this chapter.

Since maximum accuracy of distribution can only be obtained by analysing large-scale maps showing detail of settlement and valid at the appropriate time, the intervals at which it is possible to construct such dot maps are governed by the base maps available in relation to enumeration returns. In this, Scotland is particularly fortunate in not only having an enumeration as early as 1755 but also in the existence of Roy's maps of the same period. Other base maps used are Thomson's Atlas of 1821 and the 1st, 3rd, 4th, 7th, and 7th revised editions of the Ordnance Survey 1 inch to 1 mile topographic sheets. While it would have been possible to produce more accurate distributions by using the larger-scale Ordnance Survey maps as bases, such as the 2½-inch or 6-inch maps, it was considered more useful to take the above-mentioned for this reason: comparison between these distribution maps is particularly significant in that each base map, with the exception of Thomson's, is on the scale 1:63,360, and even Thomson's maps are only fractionally smaller in

scale. It should be noted here that although Roy's maps too are drawn on a smaller scale, the base map used for the 1755 set of maps was on the scale 1:63,360. Thus it has been possible to construct eight distinct but comparative dot distribution maps for each of the four counties within the time-span of 210 years, using each dot to represent five persons.

The representation of burghs on the dot distribution maps presented yet another problem. To have used the dot system would have produced a blob of coalescing dots, thereby confusing the eye and reducing the value of the map. As an alternative, proportional circles were considered. Used correctly, such circles should be proportional in size to that of the dot representing five persons. For a burgh of over 19,000 persons, such as Hawick in 1891, the circle size would be too large to be readily interpreted. Such a circle would obscure a large number of surrounding dots or, if left open, would not be sufficiently outstanding to denote a major concentration. Furthermore, proportional circles are difficult to interpret accurately. Since the Border Counties is an area of mainly rural population with only twelve urban units to be considered, it was decided to outline the town boundaries, shade the enclosed area, and give the population of the burgh. The advantages of this method of representation were that the exact area inhabited by the given number of people was shown — this accords with the conception behind the dot map — while the shading gave greater emphasis to the

more densely populated areas. It should be noted, however, that while an exact figure is given for the towns, the population of the parishes, or the landward area if a town occurs, is rounded to the nearest five persons. Parish boundaries have been marked on each map to show the small unit within which each sub-area of dot distribution mapping was undertaken, since the smaller the subdivisions are, the more accurate the map will be.

In addition, the 1,000' contour has been marked on all the maps, using the 7th edition map of the Ordnance Survey 1:63,360 as a base. The justification for showing this contour is twofold. It appeared helpful to insert some point of reference which would indicate firstly the configuration of the land and secondly would provide an upper datum line against which the distribution of population might be viewed over the period. While almost any contour between 750' and 1,200' would have satisfied the first requirement, the second was rather more demanding, since it called for consideration of what factors were relevant to the population distribution. Since height by itself is not necessarily a limiting factor, one limiting influence which was considered is climate as it is reflected in soils and agriculture. Glentworth (1954) considers that 1,000' is the upward limit of the development of Brown Forest Soils in Scotland while above this (Glentworth and Muir 1963) there is a tendency for peat to develop. Where peat formation occurs, agricultural possibilities are restricted and Glentworth (1960) states categorically that the

altitude at which agriculture in Scotland stops is 1,000'. This view is further confirmed by Stapledon (1937) and for the Border Counties themselves by Duthie (1953). The validity of the decision to take the 1,000' contour as a significant height can be judged from the maps themselves.

Each time-series of dot distribution maps will now be considered from the point of view of base materials used and problems encountered in map construction. In each case, the sheet numbers and survey dates, where possible, will be detailed in order that reference to the appropriate base maps may be made speedily without consultation of the Bibliography.

1755 Roy's Maps - Sheets 6, 7, 8, 9.

Scale: 1 inch to 1000 yards. Date of Survey: 1752-54.

The enumeration records used for the 1755 maps were those of Webster (1755) as supplied by the Old Statistical Account (1791-1799) and by Kyd (1952). This census was taken by parish ministers, between the years 1743 and 1755 although the count is usually cited as 1755. There are several features of this population enumeration which must be regarded as somewhat unsatisfactory. The Border Counties alone consisted of 79 parishes in 1755, each of which was reported by a different man whose instructions for the enumeration appear to have been vague. Many ministers counted only those persons of "examinable age", while others omitted non-Protestants and paupers.

To compensate for those under examinable age, Webster added two-ninths of the total in the parish — an arbitrary measure which cannot give confidence in the accuracy of the census. This action is defended by Kyd (1952), who contends that, in most instances, the total obtained by this method was very near to the truth. Kyd's contention is in answer to several critics of the Webster count who claimed that he exaggerated the returns for political ends. However little faith one might place in Webster's census, Scotland must be considered fortunate in having a head count at all — very few countries indeed had produced an enumeration of their population by 1755. Further examination of the accuracy of the 1755 enumeration is given, where appropriate, in the analysis of the dot distribution maps later in this chapter.

The Roy maps of the Border Counties were surveyed in the seasons 1752 to 1754 by Lieutenant David Dundas and William Roy himself. The maps were constructed from a series of measured traverses of roads and rivers and it would appear that these were not of great accuracy (Skelton 1967). The resultant distortion in the survey framework is illustrated in O'Dell (1953) and reproduced and further discussed in Skelton (1967). The relief features, land use and settlements were sketched in by eye or copied from existing maps and for this reason cannot be taken as accurate, thereby presenting another problem concerned with the construction of the dot distribution maps for 1755. A third drawback was that of scale. Since a

1:63,360 scale was thought best for direct comparison with the other maps in this series, the 1:36,000 scale of Roy's maps had to be enlarged. Since enlargement of the existing maps would lead to exaggeration of the distortion already described, it was decided to use the 1864 first edition Ordnance Survey 1:63,360 as base maps and to transfer the information given by Roy to this. As it was impossible to plot population direct, a building plot was done first. The dot distribution maps were then constructed with relation to this building plot.

The original copies of Roy's maps, held in the British Museum, were used for the building plot. In some ways, the Roy maps were easier to use than those produced by the Ordnance Survey a century later. In the first place the buildings are marked in red and are thus easily discernible. Secondly, ease of reading is increased by the lack of other detail on the maps as compared with the Ordnance Survey maps of later dates. However, some of the red markings were smudged and difficult to read. In addition, it was often hard to decipher the names of the settlements, owing partly to the script and partly to the age and resultant faintness of the ink. A further point, raised by Skelton (1967), is the question of whether a house symbol stands for a single house on the ground, located by the survey, or for a group or hamlet. He considers this to be an important factor if the map is to be used "as a basis for estimating population". In the first place, one wonders why Skelton should wish to attempt

estimating the population from these maps when there already exists for this decade an adequate head count parish by parish. However doubtful its accuracy, Webster's enumeration is inevitably more detailed and precise than any estimate made from maps of this age and limitation. Furthermore, in the present study, Roy's maps are used in conjunction with First Edition Ordnance Survey 1-inch maps. Thus, by using a little common sense, this problem can be greatly reduced.

A fourth problem occurred when attempting to transfer the buildings pattern from the Roy maps to the 1861 maps. For the most part, this was done by comparing the names of the settlements. Here a fascinating, though time-consuming, feature was discovered. Roy's surveyors had apparently written down the settlement names from verbal descriptions: thus Cambus, the old form of Cockburnspath, became Fibers and Headshaw was recorded as Itcha, to give but two examples. Unnamed settlements were difficult to locate owing to map distortion but also of course because no civil boundaries are marked on Roy's maps.

A final problem occurred in the representation of the burgh populations. Since population figures are not available for the urban areas of Scotland prior to 1841, an estimate has had to be made for each of the major burghs. As it was impossible to compute such figures with any degree of accuracy, the burgh populations shown on the map are round numbers deduced from the trend of population growth or decrease within each burgh from 1841 onwards in conjunction with

the total population of their respective parishes. Further population was shown in the immediate vicinity of these burghs by additional dots when it became apparent from the map that more people lived in the parish than could be reasonably accounted for by the number of dwellings marked on the base map. This method was used in order to stress the fact that no accuracy is claimed for the total numbers within the burghs, yet it is a reasonable assumption that such persons as could not be located in other parts of the parish were more likely to be living near population agglomerations already known than in more remote or inaccessible rural areas. It should also be pointed out here that the extent of the built-up area is frequently exaggerated since it would appear that pictorial representation was considered of greater importance by Roy's cartographers than scale drawing.

1821 Thomson's Atlas

Berwick, 1 sheet no. 3, published[1] 1821; scale 11/16 inches to 1 mile.
Peebles, 1 sheet no. 10, published 1821; scale 13/16 inches to 1 mile.
Roxburgh, 2 sheets no. 4, published 1822; scale 5/8 inches to 1 mile.
Selkirk, 1 sheet no. 5, published 1824; scale 7/8 inches to 1 mile.

Obviously, as one goes back in time, the accuracy of a population distribution map lessens since the base maps used were not surveyed in the same detail as is possible with the technological advances of modern times. As with the 1755 maps, this is true of

1. No survey dates are available for these maps.

the maps produced about 1821 in Thomson's Atlas, particularly as, unlike the other base maps used for the production of the dot distribution maps, the 1821 series are drawn up on a smaller scale with a resultant loss of precision. Again, little information may be gleaned from the base maps. The only detail shown is the relief, in the form of hachured landforms, the administrative boundaries, named villages, individual houses and farms, and the roads.

Because of lack of data both on the base map and in the census, it has been necessary to interpolate the distribution of population by reasoned deduction. The symbols used for locating dwellings on Thomson's maps differ from county to county. One symbol which appeared to be standard for all four counties was the drawing of a house signifying a mansion, castle or manor-house of an estate. Where this occurred there was usually no other building marked on the map. Yet such mansions would not have stood alone but had attached to them lodges, cottages and, most likely, a home farm. In addition, there would almost certainly have been a number of "menial servants" living in the mansion so that "the higher and middle ranks are enabled to live with more comfort, and to partake more of the pleasures of life" (Sinclair 1831). Dots were placed in the immediate vicinity of the marked dwelling to take account of such attached population. It should be noted, however, that this convention may have given the maps an appearance of less dispersion than was the case as, for instance, where gatekeepers and their families are represented as

being in close proximity to the mansion when, in fact, although associated with it, they may have lived some distance away.

Other buildings were usually denoted by black rectangles although the method of portrayal differed on the Berwick map. Here, while houses or groups of houses were marked in this way, farmsteads were shown by small open circles. Where farmsteads were named it was assumed that they were of some significant size and would have attached to them not only servants but also tied cottages, a feature which is still common in the present-day landscape. This being the case, dots were placed in a manner similar to that for mansions.

A third type of unit which appeared on the base map was the mill, marked by a black rectangle and named "mill" on all bar the Berwick map where the symbol used was similar to that denoting a tumulus on the 7th series Ordnance Survey maps. These mills were invariably shown as lone buildings divorced from any other settlement. Yet it seems reasonable to assume that cottages for mill workers and others would have been found in the shadow of the mill as, for example, at Swintonmill, Berwick. Again, such communities, although not shown in concrete fashion on the map, have been accounted for by the placing of representative dots on the distribution maps.

As was the case for 1755, urban populations are estimates and are emphasised, where applicable, by additional dots. Again no accuracy is claimed for the extent of the built-up areas owing to the limitations of the base map.

In addition to these factors, it should be noted that the amount of detail shown on the four county base maps is not uniform. The number of buildings marked on the Roxburgh sheets appears to be rather more accurate than on the other three. This fact is evident not only in the proportionate increase in number of dwellings shown per head of population but also by the fact that small dwellings in the more remote valleys are marked and named "sheils". It would therefore be true to say that of the five 1821 maps, the two showing population distribution in Roxburgh are the most accurate.

Unfortunately it has not been possible to mark the 1,000' contour on the 1821 maps, the only one of the time series where it has been omitted. It was originally thought that, in spite of the change in basic map projection, this could have been accomplished; in the attempt, however, considerable distortion of outline was discovered, resulting in a situation where a line as precise as a contour could not be marked. The drawing of a formline was considered but rejected on the grounds that the upland could be more easily interpolated from the population distribution, especially in the larger parishes, than from any other feature, thus the object of the exercise would be nullified.

It will be apparent that the 1821 maps differ in general appearance from the other series of maps and even from each other. This is a result of constructing the original maps on a smaller scale, that of the base maps. The photographic prints in Volume Two (Figs.

5, 13, 14, 26 and 33) have been enlarged to assume, as closely as possible, the scale of the other dot distribution maps. Owing to variation of original scale, however, each item marked on the maps has been enlarged to a different extent. While every effort was made to compensate for this in drafting, it has been impossible to achieve perfection.

It is thought that, in spite of these limitations, the 1821 series of dot distribution maps, and indeed the 1755 series, are meaningful and provide information which is helpful to some degree in an analysis of the population distribution and change which took place prior to 1861.

1861 First Edition Ordnance Survey 1 inch to 1 mile

Sheet	11 : survey date	1857-58
"	16 : " "	1856-59
"	17 : " "	1857-59
"	18 : " "	1858-60
"	24 : " "	1855-59
"	25 : " "	1855-59
"	26 : " "	1856-59
"	32 : " "	1851-56
"	33 : " "	1855-57
"	34 : " "	1855-58

The base maps used for the 1861 dot distribution series were the First Edition 1 inch to 1 mile Ordnance Survey topographical sheets. These maps, like the New Series of the English 1-inch maps, are reductions of maps surveyed on the scale 6 inches to 1 mile (Harley 1964) and the sheets from which the building pattern was taken

were not the hachured but the contoured publication. With the exception of Sheet 32 (Edinburgh), the base maps were surveyed between 1855 and 1860 and published from 1863 to 1865. These dates correspond most closely with the Census Report, Scotland, for 1861, which was used as the source of population data. Sheet 32 (Edinburgh), however, had been surveyed much earlier and was published in 1857. This time-factor is considered to be of little importance as only a small portion of upland Peebles, with two marked dwellings, is involved.

The major problem in the construction of the 1861 maps was that of portraying those parishes whose boundaries have changed during the study period. Most of such changes were the work of the Boundary Commissioners who had been appointed by the Local Government (Scotland) Act, 1889, and were effected in the 1890s. All four counties were affected by boundary change at this time in an attempt to simplify the administrative areas, mainly by getting rid of all detached portions of parishes and counties, although other alterations also occurred. It was decided that continuity was of prime importance in these dot distribution maps. Thus, while boundaries are mapped as they existed in the mid-nineteenth century, the distribution of dots in each figure is shown over an area which corresponds, as far as is possible, with the most recent series of maps. While a reference map of current parish and county boundaries is included (Fig. 2), no key is provided for the situation in 1861. In most instances the changes are obvious or minor in extent, but if further information is

required, reference should be made to the appropriate 1-inch sheet. All changes made by the Boundary Commissioners in the 1890s are itemised by Shennan (1892). It should be noted that this solution to the problem is equally applicable to the 1755 series of maps in that the First Edition 1 inch to 1 mile maps were used as the bases for the building plot. The 1821 series, however, could not be treated in this way owing to the difference in base map scales, and these maps have been drafted within the limits of Thomson's maps.

The special cases of Caddonfoot and Galashiels/Melrose parish should be considered at this point. Caddonfoot was created by the Boundary Commissioners from that part of Stow parish which lay in Selkirk together with small portions of the parishes of Selkirk, Galashiels and Yarrow. After 1892, the parish of Stow lay wholly within the county of Edinburgh. On dot distribution maps prior to that date, the population figures used for Caddonfoot were those of the Selkirk portion of Stow. The boundary between Galashiels and Melrose parish presents a problem throughout the study period. On the First Edition Ordnance Survey map the county boundary simply disappears amid the town's road and building pattern. As Shennan (1892) points out, there was no clearly defined delimitation of Galashiels and the burgh was one of those in Scotland to experience change at the hands of the Boundary Commissioners. The limit set by this body was that the county boundary should coincide with whatever the police burgh boundary might be at any given time. Thus, since the turn of the

century, the Roxburgh/Selkirk boundary has been subject to several alterations, small in areal extent but significant in number of inhabitants (see, for example, Census Report, Scotland, 1961, Melrose parish in Roxburgh).

A final difficulty was experienced in the placing of dots in the parishes of Ayton, Castleton, Chirnside, Roberton and Yetholm, all of which were found to contain population greatly in excess of the dwellings marked on the base map. The solution to the problem in Castleton is explained in the analysis of population distribution later in this chapter. For the remainder, dots were placed in the villages where no other location seemed feasible. It should be noted, however, that the distribution pattern in these five parishes may be less accurate than elsewhere in the 1861 series.

1901 Third Edition Ordnance Survey 1 inch to 1 mile

Sheet	11	: Survey date	1901-2
"	16	: " "	1901-2
"	17	: " "	1901-2
"	18	: " "	1901
"	24	: " "	1901
"	25	: " "	1901-2
"	26	: " "	1901-2
"	32	: " "	1894-95
"	33	: " "	1901
"	34	: " "	1901

The 1901 dot distribution maps were constructed from the Third Edition 1 inch to 1 mile Ordnance Survey topographical sheets in conjunction with the Census Report, Scotland, 1901. As may be seen from the above, the coincidence of the date of the base map survey and of

the census is almost exact with the exception once again of Sheet 32 (Edinburgh), which, although surveyed much earlier, shows the same small, virtually uninhabited portion of Peebles. The sheets used as bases were those published in black and white although Harley (1964) states that this edition was also available in coloured format. It will be noted that the Second Edition 1 inch to 1 mile Ordnance Survey maps have not been used in this study. As this revision took place in 1894 to 1895, no advantage could be gained from its use in conjunction with the 1901 census, while too many boundary changes had occurred for it to be of value if used with the 1891 census.

Few problems arose in the drafting of this or any of the more recent series of dot distribution maps, owing to improved base maps and few boundary changes. The only difficulty experienced with the 1901 series was the inflated population of the parish of Tweedsmuir in Peebles. This is discussed later in the chapter.

1921 Fourth Edition Ordnance Survey 1 inch to 1 mile

Sheet	73 :	survey date 1923-24
"	74 :	survey date 1923
"	75 :	" " 1922-23
"	79 :	" " 1922-23
"	80 :	" " 1922-23
"	81 :	" " 1921-23
"	84 :	" " 1922-23
"	85 :	" " 1922
"	86 :	" " 1921-22
"	89 :	" " 1922

The base maps used for the 1921 series were those of the Fourth

Edition 1 inch to 1 mile Ordnance Survey sheets, perhaps better known as the "Popular" Edition. The survey dates again correspond fairly well with that of the Census Report, Scotland, 1921, from which the population data were taken. However, this Census Report is regarded as rather unsatisfactory by many research workers, since enumeration took place in June instead of in April and the question arose as to whether this series would be valuable or not. The decision to include a set of maps for 1921 was made for the following reasons. Firstly, had these maps been excluded a gap of fifty years would have existed between the 1901 and the 1951 series. In the second place, whatever the enumeration date and however suspect the data, these maps would prove no less reliable on that account than those of 1755 and 1821. Furthermore, this was a full census and, as such, must be considered at least as significant as figures derived from the 10% sample enumeration of, for instance, the 1966 Sample Census. Thirdly, the construction of the maps might help to demonstrate to what extent the census data are unreliable within the context of the Border Counties, a point which is further discussed later in this chapter. Lastly and more tenuously, 1921 is the closest date at which dot distribution maps could be constructed for possible further research in conjunction with the Land Use Survey of the early 1930s.

1951 Seventh Edition Ordnance Survey 1 inch to 1 mile

Sheet 61 : survey date 1954-55
" 62 : " " 1953-54
" 63 : " " 1952

Sheet 64 : survey date 1952
" 68 : " " 1954-55
" 69 : " " 1953
" 70 : " " 1952-53
" 76 : " " 1951-52

The 1951 series of dot distribution maps were compiled from the Seventh Edition or Seventh Series 1 inch to 1 mile Ordnance Survey maps together with the Census Report, Scotland, 1951. It will be noted that both the Fifth Edition and the Sixth Edition 1 inch to 1 mile Ordnance Survey sheets have not been utilised. There are no adequate population figures available for use in conjunction with the Fifth Edition or "War Revision". Some doubt exists as to how much revision took place before the publication in 1947 of the Sixth Edition or "New Popular" Edition, as the only information given on the relevant sheets is to the effect that full revision was undertaken between 1920 and 1923 "with later corrections". Furthermore, such corrections must have been carried out at a date more remote from the 1951 census enumeration than those for the production of the Seventh Series sheets, thereby rendering them less relevant.

1961 Seventh Edition Revised Ordnance Survey 1 inch to 1 mile

Sheet 61 : survey date 1963
" 62 : " " 1963
" 63 : " " 1963
" 64 : " " 1963-64
" 68 : " " 1962
" 69 : " " 1962
" 70 : " " 1961-62
" 76 : " " 1961-62

This last of the dot distribution series of maps was based on

the Seventh Series Revised 1 inch to 1 mile Ordnance Survey sheets and the Census Report, Scotland, 1961. Although relatively little change had taken place in the Border Counties between 1951 and 1961, it was thought important to bring the sequence up to date, especially in view of recent interest in the Border Counties as a region of future population growth (for example, see Scottish Development Department 1968).

3. The Analysis

It has been decided to analyse population distribution and change county by county. The disadvantages which accrue from sub-dividing the Border Counties region along mainly arbitrary civil boundaries are obvious. It results in separating the Merse lowlands of Berwick from those of Roxburgh which show considerable affinity and in divorcing examination of the taxtile-based economy of Selkirk from that of Peebles although close parallels exist. Nevertheless it was thought that a simultaneous analysis of all eighty-three parishes was too cumbersome. Attempts will be made, however, to emphasise such spatial correlations where they exist. The order of analysis by county is from the lower Tweed basin to the upper valley. This is more meaningful than an alphabetical arrangement and it is hoped that the effect on population change of the transition from the

uniformly agricultural area of Berwick through the two-fold economy in Roxburgh and Selkirk to the tripartite base of agriculture, textiles and tourism in Peebles, will be seen to be significant.

Berwick

The first map in the dot-distribution series, Fig. 4, depicts Berwick in 1755. According to Webster (Kyd 1952) the total population at this time was 24,946. Already, an initial problem is encountered. Can this figure be considered reliable in view of the remarkable 20% growth rate between it and the counts of 1790 and 1801? As has been noted above aspersions have been cast on the accuracy of Webster's enumeration and, while it may never be possible to refute or confirm the reliability of the 1755 figures, one is here confronted with the opportunity of going a little way toward that goal.

Of the four Border Counties, Berwick has always been the one to rely most heavily on agriculture as its major source of employment. According to Murison (1926), "up to the close of the 18th century, agriculture in the Border Counties was not a very successful enterprise ... nevertheless, great advance had been made since the days prior to the Union, when Scottish farming was hardly worthy of the name." As has been seen in Chapter I, the Merse became the cradle of the Agrarian Revolution in Scotland and several important innovations had already been witnessed by 1755. As these ideas gathered momentum, the landscape of Berwick changed from moorland and swamp to valuable

arable and pasture land — an area capable of supporting and employing a much larger population in the 1750s than had previously been possible. With such a far-reaching improvement in the economy it seems that a 20% population growth rate is not only possible but probable.

In order to verify the conclusion that Webster's enumeration is reasonably accurate, it is necessary to examine the detailed population figures as given for such parishes as are known to have experienced agricultural improvement at a given time. Swinton is one such example. In this parish, the enclosure and drainage of the Swinton Estate took place in the 1730s and the 1755 count shows a population of 494. It is suggested that, although by the year 1755, only twenty years after the improvement, the population would not have shown a spectacular increase, yet as a result of these improvements a more noticeable increase should be apparent by the end of the century. The Old Statistical Account (1790) reveals that an increase of 80% occurred and this is borne out by a similar return for the parish in the 1801 census. Less spectacular are the figures for Duns, where in the 1750s Dr. Hutton introduced new ploughing techniques. Nevertheless, the population rose from 2593 in 1755 to 3324 in 1790, an absolute increase of 731. In Ladykirk, too, where Small invented the two-horse plough, a population increase of over 50% is found within that time-period. It is difficult to pinpoint in time or by parish other innovations in Berwick, but the above-mentioned increases may reasonably be taken as further verification of the approximate

validity of the Webster census.

The most striking feature of Figure 4 is the strong tendency for nucleation to have occurred in almost all parishes where the land does not rise above 1,000'. It will be noticed that such a pronounced village pattern is not evident on any other 1755 map except for Figure 11, which of course shows the continuation of the Merse in Roxburgh. The question arises — can any significance be attached to this pattern? On the one hand, account must be taken of the difficulties of producing a distribution map from a base map as unreliable as Roy's. On the other, it must be borne in mind that this lowland area had been subjected to repeated attack, plunder and devastation in times past with the probable result that the inhabitants banded together for defence purposes, thereby leaving an imprint on the landscape which time has not erased. The conclusion drawn is that the population was nucleated earlier than 1755 but that the size of agglomeration is over-emphasised by the nature of construction of the dot map.

The urban population is thought to represent some 14.4% of the total in the county, with Duns, the present-day county town, numerically twice the size of any other burgh. It is interesting to find that in 1755 Lauder ranks second in the county, a position stemming from its early establishment as the only Royal Burgh in the county but lost within the succeeding fifty years, never to be regained. The fishing port of Eyemouth is only slightly smaller in third

position while Coldstream appears to be the smallest town at this time with only about 500 inhabitants.

In the landward areas, a pattern of relatively dense population in the lowland Merse is firmly established with the Lammermuir uplands to the north west standing out clearly as a negative area. While this complete blank above 1,000' can in part be credited to the limitations of the base map, it is emphasised by the corridor of denser population up the Leader Valley. Three other areas not conducive to habitation are noticeable at this period, namely Coldingham Moor, Dogden Moss in Greenlaw parish, and Corsbie Moss in Legerwood and Westruther parishes. All are areas over 600' and unattractive for agriculture in view not only of their harsher physical nature, but also of the concentration of agrarian improvement in the more favourable surrounding lowlands. Lest it should be thought that the 600' contour might be more appropriate than the 1000' contour, it should be noted that all three areas are found to be subsequently inhabited, in addition to which it has already been stressed that the 1755 map is not infallible.

Some comment must be made at this point on the Old Statistical Account (1790) population count. Whilst Webster's enumeration has been evaluated as approximately correct, a similar claim cannot be made for the Old Statistical Account, whose figures appear to be too high. In both county total and fifteen out of the thirty-two parish totals, it is found that the 1790 figures are larger than those of

the first census proper ten years later. The reverse of this trend is the expected, since in the first place, the general increase, in both Berwick and its constituent parishes, to a maximum population within the period 1851 to 1871 is disrupted and, secondly, this should have been a boom period in agriculture on account of the Napoleonic Wars and because of the continuance of farming improvements within the area.

By 1821 (Fig. 5) the population of Berwick had expanded rapidly to 33,385, a growth of 25% over 1755 and of almost 10% since 1801. It is the year of maximum population in the parish of Duns, while the burgh too had probably grown close to its maximum in number of inhabitants at this time. Since transport was difficult, Duns, situated at the junction of the Merse proper and the low, rolling foothills of the Lammermuirs, proved to be in an ideally central location to develop as a market centre for much of Berwick. The parish's 20% growth between 1801 and 1821 is not, however, totally a result of urban expansion but is owed also to an increase in the number of persons found in the surrounding area where a fairly dense population existed, especially in the southern part of the parish within a three-mile radius of Duns (Fig. 5). A similar distribution is found in the contiguous parishes of Langton and Edrom whose population also soared rapidly if less spectacularly at this time. The turn of the century had been a bumper period for agricultural production and it is not surprising to find that the main market town grew to peak

population and that all land within easy reach was densely peopled. Of the other three towns in Berwick, Lauder shows the smallest gain in numbers. Being located to one side of the main agricultural heartland of the Tweed Valley, it was not in a position to benefit greatly from the agrarian improvements. Eyemouth, meanwhile, expanded more rapidly not only because of its advantageous location as a fishing port but also, according to popular account, as a thriving centre for smuggling in view of its charter as a free port. Its population is thought to have increased by over 50%. Coldstream provides the most startling increase of the four burghs. Most of its 300% increase occurred prior to the 1801 census and while this could be conveniently laid on Webster's shoulders again, the present writer thinks that Webster is not wholly and perhaps not even partly at fault in this case. Two important factors must be considered. First, the Coldstream Guards had their Headquarters in the town and while the census would include such men in their count, it is doubtful that Webster would do so. Secondly, until 1755 there was no bridge across the River Tweed downstream of Kelso. The river was forded at Coldstream but the completion of the bridge in 1766, together with a stable relationship with the area south of the Tweed, must have increased the volume of traffic into and through the town, thus developing its importance to a great extent.

In the landward areas the difference between land below and above 600' is easily discernible, since the population density is so much greater in the south and east of the county. A sparser though

fairly even distribution is found in areas between 600' and 1,000' and the mosses and moorlands discussed in 1755 are now seen to be inhabited. Population occurs above the 1,000' level notably in Westruther, whose maximum population is registered at this time, and in Channelkirk.

Maximum population is recorded for Berwick as a whole in 1861 (Fig. 6) with a total of 36,613 inhabitants. It should be noted, however, that there is little variation in total numbers between 1851 and 1871 when the census records over 36,000 at each decade. Disregarding the pre-census counts, twenty-two of the thirty-two Berwick parishes registered maximum population during this twenty-one-year span. Of the other ten, eight had passed their peak (two of these were discussed in the analysis for 1821).

However, the urban areas show rather more variation than the parishes of the county. The population of Lauder was enumerated precisely in 1841 for the first time, when there were 1,148 residents, more than at any other time, as far as can be ascertained. Until 1871 the figure stayed above 1,100 with the town acting as a market centre for Lauderdale, a function aided by its Royal Burgh status and by its position on one of the easier routeways through the Lammermuirs, the one now followed by the A68 trunk road. In addition, Lauder shared at this time in the woollen manufacturing industry of the Border Counties. Coldstream parish had achieved maximum population in 1851 and it is assumed that the urban sector was also at its peak at this

date since examination of later figures yields the information that both decrease from that time onwards but, as might be expected, at different contraction rates. The expansion to 1851 is thought to be a carry-over from the causes of original growth to 1821. Although, as previously stated, Duns parish registered maximum population in 1821, the town itself continued to expand until 1871 when its inhabitants numbered some 2618 persons. This continued growth after 1861 was probably aided by the opening in 1863 of the Berwickshire Railway which ran from Duns to Earlston and linked eastwards through Edrom and Chirnside with the main east coast London to Edinburgh line at Reston, thereby increasing Duns' sphere of influence. A further extension of this railway westward to St. Boswells appears to have had little effect on the fortunes of Duns, for the population decreased steadily in the ensuing decades. A more important reason for growth in the 1860s is to be found in the additional status of county town granted in 1853 which brought added employment opportunities to the town. Eyemouth, on the other hand, expanded by a further 50% in 1861 with the increasing number and size of fishing boats and a high percentage of the inhabitants were employed in some aspect of the fishing industry (Murison 1926). In view of the relatively small size of the Berwick towns as compared with other towns in the Border Counties, it is not surprising to find that areally the built-up sections are not extensive and thus do not impinge on the eye as do urban centres on the other maps of this series. Duns, for example, only covers an

area of approximately 1.3 square miles in 1861 and Coldstream some 1.8 square miles.

In the rural areas the distribution of villages along the line of the Merse lowland is still the most striking feature although the pattern has altered since 1755 and indeed since 1821. While previously the villages appeared of similar size throughout the Merse, by 1861 certain nuclei have expanded at a greater rate than others. In the southern portion of the county, the enlarged villages of approximately 700 inhabitants are some nine miles apart while in the north-east section the distance is as little as four miles. These larger entities, namely Earlston, Greenlaw, Swinton, Chirnside, Ayton and Coldingham, are found to be not solely local market centres but places of minor industrial or other importance. Earlston owes its growth to textile manufacturing, especially to the making of "gingham", for which it was renowned in the nineteenth century, while Ayton and Chirnside had paper-mills already established by 1861. The development of Greenlaw is probably due to its function as county town of Berwick from 1696 to 1853, when it was replaced by Duns. Swinton is an unusual estate village which appears to have grown as a result of careful management. The size of Coldingham is more difficult to explain, but its location at the edge of the then bleak and desolate Coldingham Moor seems to account for its origin as a haven for travellers some centuries previously.

Between these large villages lie smaller ones, usually one centre for each parish (or more than one in the case of the larger

parishes) approximately three miles apart. Examples may be seen in Legerwood, Gordon, Hume, Westruther and Whitsome. The dispersed population is more dense in the Merse than to the north of it but, in this northern section, it is more evenly spread throughout than in previous times. Above 1,000' few inhabitants are to be found and those shown on the 1821 map, especially noticeable in Channelkirk, have all but disappeared by 1861, a fact which, in spite of the rise in the upward limit of cultivation, can only cause the Thomson map to be viewed with some scepticism.

Population change at parish level between 1801 and 1861 can be grouped into two types. First, there are those parishes which have shown a steady increase to a maximum followed by a decline. The majority of the parishes fall into this category, twenty-one in all. Each of these shows the same pattern of population change whether reaching an early or late maximum, although some minor fluctuations may occur. For example, Coldingham in 1831 decreased by 7 persons over 1821 but such a small decrease within a period of general increase can hardly be considered significant. The growth rates, 1801 to maximum population, vary from 10% as in Foulden parish to 50% as instanced by Eyemouth parish. The second type of change is one of initial high population or of increase until 1821, followed by a downward trend rising again to near or even above the earlier peak. The parishes where this pattern is displayed are mainly grouped together in the north centre of the county, namely Longformacus, Cranshaw, Abbey St. Bathans, Bunkle and Preston, Duns, Langton, Polwarth,

Fogo, and Edrom with "outliers" to east and west in Ladykirk and Hume. A possible explanation is that since all these parishes lie within five miles of Duns (as may be seen from Figure 2), their fortunes and their population statistics are closely linked with that burgh. The case of Duns has already been discussed. Nevertheless, it is difficult to explain the presence of Ladykirk and Hume in this group. Perhaps it is more likely that the common cause of this pattern of change, if indeed there is one, lies in the complete dependence of these parishes on agriculture, so much so that the population figures reflected almost exactly the highs and lows of farm production as described in Chapter I.

Between 1861 and 1961 Berwick displays a classic example of continuous depopulation, plunging from maximum to minimum in the space of a hundred years. By 1961 the total population had reached its lowest ebb, only 22,437. Unlike the Highlands and Islands of Scotland, about which so much is heard, this heavy depopulation is not found in an area of harsh climate, difficult and infertile terrain and poor communications but of mild equable climate where drought is more of a problem than prolonged rainfall, of fertile, lowlying land, and through which run two major routeways from England to Central Scotland. Great emphasis is placed on agriculture in the economy of Berwick. Of farming in Berwick and Roxburgh, Murison (1926) had this to say: "It is the union of these two branches [stock and crop husbandry] which is the secret of the Border agriculturalist's success,

and which indeed forms the basis of all advanced and successful farming. In this respect neither of the counties is equalled by any other county in Scotland; for they excel not only on account of uniting the two branches, but in the efficient manner in which both departments are carried out." It is this efficiency combined with amalgamation of holdings to form some of the largest arable farms in the nation which has led to uninterrupted depopulation of the countryside. This improvement and amalgamation has been a continuous process over the past century and with it has come a continuous decrease in manpower requirements. Although continuous, the contraction rate has not been steady but accelerated at certain times, for instance between 1881 and 1891 when the absolute decrease amounted to 3,000 persons. However, at no time has it been arrested although authorities are hopeful of a reversal of the trend in the 1960s. Since there is virtually no alternative employment in Berwick, the migration that has occurred has been to areas outwith the county.

Non-agricultural activity is at present found in only five of the thirty-two parishes of the county and the population trends of these differ markedly from the other parishes. Earlston's population remained remarkably steady throughout this hundred-year period, although fluctuations do exist concurrent with those of the textile industry. One such noticeable variation was seen in the post-war depression years of the 1920s and 1930s. During World War I, textile manufacture was buoyed up by the heavy Government orders for khaki which kept every loom working, but with lack of orders and

therefore of production after the war, the population had decreased by 6% in 1921 from the pre-war figure. The situation has never been as crucial since then, and, although slow to recover, the population was still rising in 1961, Earlston being one of only four parishes whose minimum population was not recorded at that time.

The importance of the fishing industry to the growth of Eyemouth has already been discussed. Between 1861 and 1961 the parish and burgh of Eyemouth apparently follow the trend of the county as a whole. However, the situation here cannot be divorced from that of Ayton in that it is not clear to what extent the burgh lies outwith its parish namesake. Indeed the two parishes had to be mapped as a single unit because the population of Eyemouth burgh has exceeded that of the parish in the last two censuses. Although the population of Eyemouth parish has fallen at a greater rate than that of the town while that of Ayton has increased correspondingly, this is not due solely to boundary change in Eyemouth burgh. The village of Ayton is remarkable for its growth in recent years. However, it should be noted that for much of this period the two parishes displayed a pattern of population decrease similar to that of the rest of the county and it is only since World War II that a certain revitalisation has occurred with alternative employment opportunities.

Chirnside, too, departs from the norm, in this case prior to 1901. Here again industry is found in the form of a paper-mill which has employed upwards of 300 hands (Murison 1926). Since the factory's

establishment in 1842 at Chirnside Bridge, the population has fluctuated with each census to 1901 and it may be that these variations reflect the fortunes of the paper-mill since a dismissal of twenty workers could result in an out-migration of eighty, assuming a family size of only four. In 1901, Chirnside parish achieved maximum population, but since that date it has hastened to emulate the decline of many purely agricultural parishes by reaching an all-time low sixty years later.

Duns is the fifth parish to show a divergent population pattern with upsurges in 1901 and 1951. Here again the economy of town and parish has a broader base than the surrounding agricultural area. This is partly due to small industrial concerns in the area such as the manufacture of high-quality blankets at Cumledge, near Duns, but more especially to the burgh's status as county town with its associated administrative functions.

However, apart from these five parishes, the general trend of parish population change between 1861 and 1961 is set by the county. The only variation that may be found between one parish and another is rate of depopulation which ranges from approximately 33%, as in Coldingham, to over 60%, illustrated by Westruther and Whitsome, but most commonly about 50%. Only two other types of deviations interrupt the pattern. The first is the numerous boundary changes made by the Boundary Commissioners (for which see above and Shennan 1892). Parishes whose population totals were thus affected in 1901 are Abbey St. Bathans, Cranshaws, Earlston (?), Eyemouth, Longformacus, and

Nenthorn. The second exception is provided by the parishes of Foulden and Mordington. Although both reach minimum population in 1961, no real pattern can be discerned in the population decline and it is suggested that the irregularities between one census and the next are a reflection of the proximity of Berwick-upon-Tweed some four miles distant.

With regard to the urban areas, little comment need be added to the above since all four burghs repeat the general population trend of the county. Some deviations do occur, of course, and may be noted in passing. Both Eyemouth and Lauder show increases in 1921 which may be the effect of the June enumeration. Both are attractive to the vacation fisherman, the former for sea fishing, the latter, well-known for fresh-water angling. Duns and Coldstream on the other hand registered rises in number of inhabitants in 1951 and this may be explained by the post-war rise in the birth rate. Both record decreases, however, in 1961. Unlike the other Border Counties there is no large urban centre within the county of Berwick — the largest in 1961 being Eyemouth with a population of just over 2,000. It is felt that this factor alone has been a major contributor to the migration outwith the county. The initial movement from a rural to an urban environment which has been prevalent in Scotland, as in other parts of the world in recent times, has been especially detrimental to Berwick in that no sizeable burgh exists. Thus migration has been directed to the large urban centres to north and south without an

intermediate staging-point, with the possible exception of the English town of Berwick-upon-Tweed.

Figures 7, 8, 9 and 10 have been drawn to represent in map form the process of depopulation of Berwick described above. It is interesting to find here a reversal of the previous trend. Dispersed population dwindles gradually and uninhabited areas reappear, especially north of the Merse lowlands. The land above 1,000' slowly returns to being virtually uninhabited. The parishes' villages decreased in size by stages until, by 1961, it is difficult to distinguish them from the larger farms, while most of the larger nucleations are considerably reduced, particularly noticeably in the village of Coldingham. It is even more fascinating to compare Figure 10 with Figure 4 and to find that there is almost no difference between the two distribution patterns except that dispersed population becomes sparser in 1961 compensated to some extent but not entirely by urban growth. It would appear that agricultural efficiency has done more to depopulate the landscape than hundreds of years of war, plunder, and devastation.

Roxburgh

Since there is no particular significance in the line of division between North and South Roxburgh, the population of the county as a whole will be examined in time sequence, but it should be noted that in this case there are two consecutively numbered maps to represent the county at each time-interval. However, certain physical

distinctions do exist within the county and have an influence on its economy and thus on the nature and rate of population change. The north-eastern boundary of Roxburgh follows the River Tweed, thus dividing the Merse lowland into two portions, one in Berwick as discussed above, the other in Roxburgh. To the south of the Merse lie the Cheviot foothills incised by the River Teviot and its tributaries, while the northward projection of Melrose parish extends into the lower slopes of the Lammermuirs; the parish of Castleton, on the other hand, occupies northern Liddesdale on the south side of the main Cheviot range.

In 1755, the total population of Roxburgh is thought to have been 31,273 rising to 32,620 in 1790 and 33,721 by 1801. Let us consider again the possibility of over-enumeration by Webster, especially since rate of growth up to 1801 is far exceeded by that from 1801 to 1851, an equivalent time-span though of course not comparable in other respects. An examination of the parish figures of both Webster and the Old Statistical Account show that only Hownam, Jedburgh, Sprouston and Stichill parishes are excessively high compared with the 1801 census. The other twenty-six parishes are found in 1755 to be smaller or show parity with the later figures. It was decided to accept the Webster enumeration as it stood and to map these anomalies as accurately as possible but to refrain from emphasising them or attempting to draw any conclusions in the commentary where corroborative evidence is lacking. Particular difficulty was

experienced for instance in Jedburgh parish, where it was found impossible to place all the dots within the area. Thus Jedburgh town's population is excessively large estimated at 3,000 in 1755 when the first reliable figure in 1841 was 2697 and 3,000 was not achieved again until 1871.

The distribution pattern of population in the northern portion of Figure 11 is remarkably similar to that of Figure 4. This is only to be expected in that it represents the westward extension of the Merse lowlands of Berwick. Analysis of this pattern need not be repeated here except to note that each parish again has one, two, three or even four (as in the case of Melrose parish) population nuclei. To the north, the Lammermuir foothill zone displays a similar dispersed and sparser distribution of population which disappears entirely above the 1,000' level. To the south of the Merse, the population is also largely non-nucleated with the notable exceptions of Jedburgh (Fig. 11) and Hawick/Wilton (Fig. 12). However, the character of the dispersion differs in aligning along the finger valleys of the River Teviot and its tributaries. Even without the aid of contours, the configuration of the topography may be distinguished from the population distribution. As might be expected, the population dwindles southward towards the main range of the Cheviot Hills and is absent altogether above 1,000'. In the parish of Castleton, the upland areas are again devoid of inhabitants and the population is largely confined to the Liddel River valley floor.

The three burghs of Kelso, Jedburgh and Hawick are estimated at this time (1755) to be of similar population size, while Melrose is a much smaller community of one quarter the size. Three of the four burghs are, of course, ecclesiastical in origin or development, while it is thought that Hawick dates back to only the sixteenth century. The growth of this last-named is owing to its function as a market centre for the Teviot area and it was only after the introduction of the stocking frame in 1771 that woollen manufacture played its part in the town's population expansion.

By 1821 (Figs. 13 and 14) the total population had risen by at least 25% to 40,892. The causes of this remarkable growth rate were twofold, namely the improved agricultural techniques and the impact of the textile industry.

Agriculture within the county flourished along lines similar to those described for Berwick and need not be elaborated here. The land improvement schemes and the demand for agricultural produce at the turn of the century had brought about an extension of cultivated land and an increase in manpower requirements. Indeed six parishes registered their maximum population in either 1811 or 1821 and all of these, namely Minto, Bedrule, Crailing, Oxnam, Hownam and Morebattle, occupy the lower portions of the finger dales on the margins of the Tweed Basin. The only two parishes which lie within this area and are not represented above are Hawick and Jedburgh, both of which, by virtue of their urbanised nature, must be considered as special cases.

Throughout the remainder of the county population had been expanding as more land was put under intensive cultivation.

In the urban areas, population had been increasing too, but since the burgh figures are still only estimates, it is impossible to draw any far-reaching conclusions. It should be noted perhaps that the population of Jedburgh is estimated at 2,600 in 1821 and that this figure is probably still rather high since that of 1841 is only 2,697. Woollen manufacture did not begin at Jedburgh until the 1850s and it is difficult to find just cause for such a high estimate. However, because of limitations perhaps of the base map, it was found impossible to locate the population of the parish at any other point. Kelso meanwhile had expanded rapidly since 1755 with an 80% growth rate and it had indeed become a thriving town, the focal point of the western portion of the Merse. The burgh's location at the junction of the Tweed and Teviot valleys has aided its development as a busy market town, as has the existence of a bridge over the Tweed at this point since 1754. Meanwhile Melrose had increased by some 20%, but it is apparent that its rate of growth is stunted by the existence of five other villages within a two-mile radius. It should be noted that for the purposes of constructing Figure 14 the parishes of Wilton and Hawick were regarded as one unit. Thus the estimated population of Hawick is, in fact, that for the whole Hawick/Wilton complex.

The dot maps (Figs. 13 and 14) reveal that the population in

1821 is more evenly distributed than was the case in 1755. With a few exceptions, for example Newcastleton, nucleations become less noticeable and it is often difficult to distinguish the single parish focal point of the 1755 period. It would be a mistake however to over-emphasize this feature in view of the nature of the base maps used to this date. While population still tends to avoid the terrain above 1,000', the black areas of the 1755 maps are not so clearly defined in 1821 and this is particularly noticeable in the Cheviots to the north of Castleton.

Figures 15 and 16 show the population distribution as it existed in 1861 when a maximum total of 54,119 persons was recorded for Roxburgh. All but seven of the parishes of the county had registered their highest population totals before this date while the parishes of Roxburgh, Cavers and Castleton show their peak in 1861 itself.

The case of Castleton at this time proved to be something of an enigma since a population of 3,688 was recorded as opposed to 2,135 in 1851 and 2,202 in 1871. The problem of mapping this extremely large increase was solved by portraying the village of Newcastleton as an urban area and by querying its population at 2,250, this being the number of persons impossible to locate from buildings marked on the base map. There is no other evidence, as far as can be ascertained, to support this action. The problem remained, however, as to how Castleton came to show a 50% increase in 1861. From the 1861 census it was found that, of the 3,688 total, 1,724 persons were "temporarily present" in the parish on enumeration night. The same

source also shows that males outnumbered females by almost two to one, and that there were 216 more inhabited houses than in 1851. Thus three problems faced the research worker instead of one: why were there so many males temporarily present? how can 200 houses appear and vanish in the space of twenty years (for there is no record of their being uninhabited in either 1851 or 1871)? and what is the explanation of the low figure, 1,964, of permanent residents in the parish in 1861? Some clue as to the answers was sought in the place of birth tables. These are recorded at county level, however, and although it was found that a high percentage of the 1861 population was of foreign extraction — 1,260 Irish and 1,188 English — there is no justification for supposing that almost all of these were present in Castleton. Newcastleton is a village planned and created in 1793 by the third Duke of Buccleuch as a hand-loom weaving village and although it later developed a marketing function in relation to livestock, it was difficult to see any connection between these facts and 1700 men in 1861. Since almost the only man-made feature other than buildings shown on the map was the railway, an answer to the problem was sought here. It was found that, although the route from Edinburgh to Hawick had been completed in 1849, the section of track between Hawick and Carlisle was not authorised until 1859 and was eventually opened in July 1862 (Vallance 1965). It seems more than likely therefore that the temporarily present males were railway navvies and that they had been housed in temporary huts or caravans of some description. It has not been possible, however,

to locate them accurately on enumeration night (although it is suggested that Newcastleton is as probable a site as any other point along the railway), nor to explain the decrease in numbers of permanent residents at this time.

Elsewhere cultivation was being extended and improved with government aid and the additional manpower required in this venture is reflected in the population figures. In spite of early maxima, the number of inhabitants in the rural areas did not decrease steadily, as was the case in Berwick, but remained comparatively stable for several decades. Morebattle provides a fairly typical example where, following a parish maximum of 1,070 in 1821, totals of 1,055, 1,051, 997, 1,031, 986 and 1,003 were recorded at the end of each decade to 1881. Atypical population change is found in Melrose, St. Boswells, Makerstoun and Hawick parishes and these cases are analysed later in this chapter.

The actual pattern of dot distribution in Figures 15 and 16 has altered little since 1821. However, nucleation in the Merse re-asserts itself to some extent as at Lilliesleaf, Ancrum, Sprouston and the twin villages and gypsy strongholds of Yetholm and Kirk Yetholm for example. The Teviot dales are marked by an even denser ribbon of population especially noticeable along the River Teviot itself. Within the area over 1,000', few residents are to be found except in northern Melrose parish and along the routeways across the Cheviots in Liddesdale.

Of the burghs only Kelso reflects the general trend of the parishes. Peak population there was achieved in 1851, fluctuation experienced to 1881, and decline to 1931. Hawick shows steady increase throughout the period to 1861 in both town and parish. It should be noted that on Figure 16 an exact figure is given for the population of Hawick. To the north of the parish boundary, the built-up area of Wilton was estimated to have 2,000 inhabitants. This problem does not recur since the Boundary Commissioners decided in 1892 to amalgamate the parishes of Hawick and Wilton minus that portion now found in Teviothead (see Shennan 1892). The history and population change of Melrose resembles closely that of Hawick and indeed in 1776 had more than twice as many looms as had Hawick, though none remained by the 1920s (Murison 1926). Jedburgh, on the other hand, provides an interesting comparison. Maximum population was recorded in 1831 yet woollen manufacture here was not started until about 1850. The parish and the urban population did, in fact, increase in 1851 but 1861 saw the second lowest number of residents in the town during the period of burgh census-taking. Textiles never had the impact on Jedburgh that they exerted over the populations of other Border towns.

By 1901 (Figs. 17 and 18) the population of Roxburgh had fallen to 48,804, a decrease of some 11% over 1861. This decrease is not wholly significant, however, nor is the 4,000 absolute decrease since 1891 in view of the activities of the Boundary Commissioners in 1892.

Indeed fourteen of the former thirty-three parishes of the county were subjected to change at this time. Few alterations involved movement of the county boundary and what Roxburgh lost in Ashkirk she partially gained in Roberton. However, the fact remains that even where minor boundary changes occur, precise conclusions are difficult to draw. The general population trend is one of decline and by 1901 all parishes with the exception of St. Boswells had passed their maximum and now showed depopulation. As already stated, most prishes maintained their population until the 1880s when falling grain prices resulted in manpower reduction and an out-migration from the farming areas (see page 17 above). Meanwhile, the textile industry, where production and employment increased until the 1890s, had equally fallen on hard times. Thus the woollen towns could not now provide the alternative source of employment that they probably had done in 1891 and the migration was largely to centres wholly outwith the county. Population decrease was experienced at various rates but every parish did decrease between 1891 and 1901 except one — Smailholm, where an increase of one person was recorded. One problem may be noted at this time, to which no answer is readily available: namely the fluctuations which occur in Makerstoun. Throughout its census history, the population of this parish has varied greatly, showing no definite trend as the surrounding parishes have done. Maximum population was experienced in 1891 at a time when other agricultural parishes were showing a downward trend. It was thought that

the proximity of Kelso might have influenced the population changes, yet there is no consistent relationship between the two sets of figures. In fact, no reasonable explanation presents itself.

The changes outlined above are very noticeable in Figures 17 and 18 as compared with Figures 15 and 16. The dot distribution, although showing much the same pattern, is considerably sparser in the areas of dispersed population and villages, especially in the Merse lowlands, are much reduced in number of inhabitants. The land over 1,000' has been virtually abandoned as an area of permanent residence. Although 20 or so persons are found on the maps above this contour in each of the parishes of Roberton and Melrose, it should be remembered that these persons may be wrongly located if the buildings marked on the Third Edition Ordnance Survey maps were uninhabited.

Meanwhile urban population change presented a different and varied picture. Hawick continued to increase with the expansion of woollen manufacture until maximum population and peak production was reached in 1891. The number of burghal residents was recorded as 19,204 in that year. There followed a drop in textile production resulting from competition which was immediately reflected in a decrease of some 10% in the burgh's population within the next decade. This decrease continued until 1931, when a sudden increase interrupts the downward trend. This coincides with a boom in knitwear production with the introduction of the "twin-set" as a staple in feminine

fashion. This arrest was only temporary, however, as is shown by Figures 22 and 24, and Hawick now shares in the population decline common to all counties in the Borders. Meanwhile, Jedburgh recorded a 10% population decrease in each decade from a peak in 1831 until 1921. However, in the depression period as represented by the 1931 figures, it was partially revitalised with a 16% increase in numbers, followed by an upswing of 25% by 1951. It seems likely that there was a movement away from the rural areas in the 1930s and that Jedburgh, as well as Hawick and Kelso, provided a focal point for some of these migrants. The large increase to a peak population by 1951 seems to have resulted partly from the post-war "bulge" but also from employment possibilities in the recently acquired factories for engineering and electrical goods. In addition Jedburgh is the last town in Scotland on the A68, a route to England via Carter Bar which has been growing in popularity for many years, and passing trade has undoubtedly boosted the town's economy. However, figures for 1961 are not encouraging for the town, showing as they do a 10% decrease in population. Population change in Jedburgh is almost exactly paralleled in Kelso although post-1921 fluctuations have been on a smaller scale. The pattern of change in Melrose, however, has been entirely different. Following a period of slow growth in the nineteenth century, the burgh increased to maximum population in 1901, an increase of 33% over 1891. The population has remained stable over

the succeeding sixty years, registering an absolute decrease of only 62 persons between the beginning and the end of that period. The extraordinary growth in 1901 is difficult to explain but judging from Figures 15 and 17 and from the parish population totals, much of this expansion has been at the expense of the surrounding villages, notably Darnick, Gattonside and Newstead and also possibly Newtown St. Boswells and Bildon. Added to this is the problem of continual boundary change from 1881 onwards and also the difficulty in ascertaining the effect on the parish population of the encroachment of Galashiels.

Figures 17 to 24 inclusive demonstrate what pattern the overall population decline has taken during the present century. In general terms, it can be described as a gradual depopulation of the rural areas accompanied by the virtual extinction of village focal points within each parish. With the passage of time dispersion grows more and more pronounced while built-up areas increase in size and dominate the dot maps. This is especially true in the case of Hawick, whose urban area almost doubles (7.7 square miles to 14.8 square miles) between 1921 and 1961 as a result of rehousing in suburban sprawl. In the dales and Cheviot area, the valley ribbons of population thin out and become disconnected especially toward higher ground. These maps illustrate more expressively than words can a situation of depopulation where only eight of the thirty Roxburgh parishes do not register minimum numbers in 1961. Of these

eight, four are the urban parishes already discussed, three are agricultural parishes whose minimum was recorded in 1931 or 1961, while the last is the special case of St. Boswells (see below). The three agricultural parishes where minimum population was registered prior to 1961 are Hobkirk, Roxburgh and Yetholm. An explanation of the growth between 1951 and 1961, which amounted to 5% to 10%, is not readily apparent, but is rather small to be considered significant.

Certain anomalies do occur within this time-span and should be noted here, although in view of the small number of persons involved they cannot be regarded as of particular significance. Six parishes registered small population increases in 1921, ranging in absolute terms from two in Lilliesleaf to thirty-four in Morebattle. It seems probable that, as these are all parishes in more remote areas, that is to say at some distance from urban centres, movement from the land after World War I was slower. In 1951, too, some parishes experienced small increases paralleled in the urban areas. These parishes were Ancrum, Cavers, Ednam and Stichill.

The present growth of St. Boswells parish began in 1931 and the population has increased at a rate of approximately 10% every ten years since that date. It may be seen from Figures 19, 21 and 23 that most of this expansion has taken place within the village of St. Boswells itself. A route, market and administrative centre since the mid-nineteenth century, St. Boswells village has long played an important role in the county. It is only in the past thirty years,

however, that these functions have attracted ancillary light industry. It is with the provision of such additional employment that the population has expanded and if the recommendations of the Scottish Development Department (1968) are implemented, will continue to do so at a more spectacular rate.

Selkirk

In 1755 (Fig. 25) Selkirk had a total population of 4,368, of which approximately 1,500 were urban dwellers. At this time Selkirk town was considerably larger than Galashiels and had a higher density of rural inhabitants in its immediate environs, a situation resulting, no doubt, from Selkirk town's function as chief market and administrative centre in an area whose economy was almost entirely agriculturally oriented. In spite of the very early presence of mills in Galashiels, Selkirk town continued to predominate until the intensive industrial development of Galashiels in the 1840s. The areal extent of Galashiels in 1755 was approximately 0.6 square miles according to Roy's maps, very small in comparison with that of the present time. Selkirk town, on the other hand, extended over an area of 1.2 square miles and has expanded areally much more slowly than Galashiels (see below).

The rural population distribution was concentrated in the valleys of the River Tweed, Ettrick Water and Gala Water. Surprisingly there is only a small diminution in density toward the headwaters, especially

in the valley of Ettrick Water where population extends well above the 1,000' contour. It is thought that these upland buildings may have been larger than the shielings marked on later maps since, as already seen, there was a marked tendency for such cottages to be omitted from Roy's maps. However, this is not necessarily the case but may be merely indicative of a change of surveyor. Although population distribution appears to extend to higher elevations than in the counties previously discussed, nevertheless the greatest density of rural inhabitants of Selkirk in 1755 is to be found in the parishes of Selkirk and Ashkirk, that is in the areas nearest to the Merse lowlands.

By 1821 (Fig. 26) the total population had increased to 6,637 at a fairly steady rate after 1801, although an apparent decrease occurred between 1755 and 1790. Here again a claim may be made for over-enumeration by Webster, but it is suggested that it is equally likely that the population of Selkirk did in fact decline until the increased agricultural and textile production of the 1790s reversed this population trend. Selkirk town had increased to some 1,400 inhabitants and Galashiels showed comparable growth. In areal extent, both burghs were approximately the same size, 0.8 square miles. From this figure it would appear that Selkirk town had shrunk since 1755, but it must be borne in mind that Roy's maps tend to exaggerate the size of settlements (Skelton 1967).

The rural population distribution differs little from that of

1755 with main concentrations in the river valleys. As in Berwick and Roxburgh, there would appear to be rather more people living above 1,000' at this time, especially in the parishes of Ettrick and Yarrow. It was about this time that cultivation was extended to land above 1,000' (see Chapter I) and, as contemporaneous population maxima were recorded in these two parishes, there seems little reason to doubt this implication of the Thomson map in Selkirk at least. Population continued to increase in the parishes of Selkirk and Caddonfoot but growth was most marked in Galashiels parish where several new areas of habitation were established.

In 1861 (Fig. 27) the population of Selkirk continued to increase steadily at an average rate of 950 persons per decade, to a total of 10,449. However, this growth was largely a result of the expansion of the towns, whose percentage of this total increased from 33% to 62%. From Figure 27, Galashiels still appears to lag behind Selkirk in population total but this is not in fact the case. Galashiels was expanding on both sides of the Roxburgh/Selkirk county boundary whereas Selkirk town lies wholly within the county as it existed in 1861. Thus Figure 27 tends to be misleading and should be read in conjunction with Figure 15 in this context. It is impossible to tell how much of Galashiels in Roxburgh was incorporated with Galashiels in Selkirk since, as already noted, the maps of this period fail to show the county boundary within the town. Although it seems likely that the whole of Galashiels in Roxburgh was included in Selkirk

(Shennan 1892), the amalgamation occurred in the intercensal period 1871 to 1881, at the time of most rapid expansion in the town's population, thereby masking any inference which might have been drawn from the census figures. In 1861 Galashiels in Selkirk extended over an area of 2.6 square miles and Selkirk town over 1.7 square miles, both significant expansions over the 1821 figures and largely a result of the building of several mills with associated housing for workers in both burghs (Dawson 1853). Galashiels in Roxburgh showed a population of 3,631 spread over 0.7 square miles, but unfortunately no figures can be given for earlier dates owing to lack of enumeration.

In the rural areas population distribution followed a pattern similar to previous periods but showing a marked decrease in numbers above 1,000'. With the demand for wool increasing, this high land was given over to sheep pasture again and many of the grain-producing arable fields put under hay (Dawson 1853) with a resultant loss of agricultural employment. The first areas to become depopulated were those at higher elevations. Over the century 1755 to 1861, Galashiels parish, including urban and non-urban dwellers, shows the greatest increase, 238.5%. Selkirk parish increased by 164.3%, while Ettrick showed a rise of 14.35%. Meanwhile Yarrow with Kirkhope appears unaffected over the century, while Ashkirk's population fell by 8.1%. It should be noted here that Kirkhope was separated from Yarrow for the first time in 1861.

By 1901 (Fig. 28), Selkirk had passed its population maximum of

27,353 in 1891 and a total of 23,356 persons were recorded. It is unfortunate that it has not been possible to construct a distribution map between 1861 and 1901 since several interesting events occurred during this period, not least the rapid increase of the population of Selkirk to its maximum. Within thirty years, the total population of the county multiplied by almost 270%. Most of this increase can be accounted for by the growth of Galashiels both in the unification of Galashiels in Selkirk and Galashiels in Roxburgh and in the remarkable rise in absolute numbers. The former added 4,567 to the population in 1871 while the population of a now unified Galashiels increased by 7,574 between 1871 and 1891. This expansion has already been discussed in Chapter I and is a direct result of the industrialisation centred on the burgh. Between 1891 and 1901 several boundary changes occurred, one of which was partly responsible for the decrease in Galashiels's population of some 5,000 inhabitants, a figure reflected in the total population of the county. A considerable proportion of this decrease, however, was a direct result of a period of industrial depression between the years 1889 and 1909 when seven mills closed down. This recession was caused by the MacKinley Tariffs (1890) in the United States, which imposed severe restrictions on the import of textiles from this and other areas (Third Statistical Account, 1964). Serious unemployment resulted and a large number of people left the town in search of work. The expansion and ensuing decline of Selkirk town's population is less dramatic than that of Galashiels with an increase of 60% in the twenty years between 1861 and 1881, the year of

maximum population. By 1901 the number of inhabitants had fallen by 500 to the lowest figure recorded in the twentieth century. These changes parallel those witnessed in Galashiels and their cause may be found in a similar expansion and recession in the textile industry. At this time Selkirk town had spread over an area of approximately 2.9 square miles while Galashiels covered 8.3 square miles.

All non-urban areas, with the exception of Caddonfoot, showed a marked decline in population by 1901, reflecting the contraction of arable farming which began in the 1880s and involved the reduction of labour to a minimum. Most parishes show a decrease of at least 20% from the 1870s and 1880s. The exception of the rapidly increasing Caddonfoot may be ascribed not only to the proximity of Selkirk town but also, of course, to the boundary changes which increased the size of the parish considerably (for which, see Shennan 1892). Figure 28 shows a continuance of the pattern of earlier maps but with decreasing concentrations in the valleys especially that of the River Tweed, although increases are noticeable at lower elevations in the eastern portion of the county especially round Selkirk town and to the north of Galashiels. There would appear to be little change from 1861 in the numbers of those living above 1,000'.

If the 1921 map (Fig. 29) is to be considered less reliable than others in this series (see 1921 maps, p. 51), one would expect the census figures to have fluctuated at this time, but in fact it is the figures for 1911 which break the general trend in Selkirk. In this

year, the total population increased by 5.3% to 24,601. The cause of this temporary increase is not immediately apparent and the Third Statistical Account (1964) ignores it completely, referring to the period 1891 to the present day as "one of steady decline". It is suggested that several factors have contributed to this rise in population numbers. As may be seen from the detailed census figures, this 5.3% expansion is a result of growth within the burghs of Galashiels and Selkirk. With an arrest in mill closure in Galashiels at this time, prospects may have appeared brighter in the textile industry and this may have not only stemmed the outflow of population but also induced some to return. Furthermore, renewed interest was shown in the textile industry with the establishment in 1909 of the South of Scotland Technical College, now the Scottish Woollen Technical College. However, this upward population trend was short-lived, and, after the increase in textile production resulting from government orders during World War I, a second recession set in, when a further eight Galashiels mills closed down during the twenty-year period 1919 to 1939. This reduction in employment potential is reflected in the 1,600 decrease in population in Galashiels by 1921.

It is interesting to find that the burghal population expansion of 1911 is mirrored to a small degree by the landward area. However, the numbers involved were very small and this arrest in the rural depopulation may be deemed insignificant in the long-term view. Its cause is certainly obscure although it may have been influenced by

the interest taken in the county's agriculture by the East of Scotland College of Agriculture founded in 1901 (Third Statistical Account, 1964). All parishes were not similarly affected, for those of Ashkirk, Kirkhope and landward Selkirk showed a continuity of the general downward trend. By 1921, however, all rural areas recorded a decreasing population. Figure 29 shows that the trend of declining population along the Tweed and Ettrick Water was maintained with an accompanying decrease in population above 1,000', especially in the parishes of Ettrick and Kirkhope.

With the exception of Selkirk town and the parish of Caddonfoot, all areas shared in the county's general population decline to a total of 21,729 in 1951 (Fig. 30). The exceptional circumstances of Caddonfoot can be explained by the establishment in 1948 of Peel Hospital, whose 328 inhabitants account for the entire increase in parish population between 1931 and 1951. The figure for Selkirk town shows a growth of 3.6% over that of 1931 and may be representative of one or more of several factors. It may be indicative of a further rural to urban migration, of the post-war "baby boom", or it may be the result of the additional employment offered by small-scale industrial development, producing a variety of goods from cellular blankets to waxed papers.

A comparison of Figures 29 and 30 reveals that the population decrease since 1921 was spread fairly evenly over the landward areas with no remarkable difference between the urban fringes and the upper

valleys. Figure 31 portrays a similar picture when Selkirk's total population in 1961 had been reduced by a further 3.1% to 21,052. This recent population decline is a feature common to all four Border counties and need not be discussed further at this point. The only noteworthy occurrence in 1961 is the increase of inhabitants in the landward area of Galashiels parish, mainly in an extension of Galashiels along the Gala Water boundary but outwith the burgh enumeration boundary.

Peebles

Figure 32 shows the population distribution of Peebles in 1755. It is immediately apparent that there is a continuation of the pattern shown by Selkirk with the population concentrated in the valleys of the River Tweed and its tributaries, especially Manor, Eddleston and Lyne Waters. The highest proportion live in the eastern part of the Tweed Valley, however, and by 1755 noticeable agglomerations of population had been established at Peebles and Innerleithen. The total population of Peebles at this time was 8,909, although this figure of Webster's appears rather high in the light of the Old Statistical Account (1790) count for Peebles of 8,107 and the first census enumeration in 1801 of 8,735. A figure of 7,909 might seem more credible but, as already seen in the case of Selkirk, the true situation is difficult to assess. Of this total, approximately 85% is thought to have been rural. This rural population is fairly evenly scattered over the lower ground, although the problem arises

once again of the possible omission of buildings on Roy's map. It would appear that certain nucleations of 200 or more persons had already taken place. These may be seen in many of the parishes but are especially noticeable in West Linton, Eddleston, Skirling, Broughton and Traquair. Unlike villages in the east of the Tweed Basin, for example in Berwick, most of those in Peebles decline at the expense of rapid urban growth in the Peebles town/Innerleithen vicinity (see below). While large uninhabited areas exist above 1,000', it is interesting to find the continuance of the ribbon of settlement along the River Tweed above that height. It seems likely that this has been affected by the shelter from harsh climatic conditions provided by the high hills to the west — an important factor in a primarily agricultural area where there is a scarcity of potentially cultivable land.

The urban population is concentrated in the two towns of Peebles and Innerleithen, with Peebles town containing almost 80% of these urban dwellers on the basis of the projected figures for this period. It appears that the 1,200 inhabitants of Peebles town occupied a smaller area than did the 250 of Innerleithen, but this again is most likely a result of map distortion.

By 1821 (Fig. 33) the total population had risen by almost 25% to 10,046. The largest increase, one of 1,200 persons, was registered between 1801 and 1811. Most of this increase is to be found in the parishes north of and including Peebles, Stobo and Kirkurd, an area

physically more conducive to settlement. It may be that the agricultural advances of the Merse area had not penetrated this part of the Borders until now, permitting larger acreage to come under the plough. Certainly the Napoleonic Wars had a great impact on farm production during this period. It is too early in the century to place any emphasis on textiles as a factor in this population expansion in spite of the 20% increase shown by Peebles parish, most of which seems to have occurred in the urban area. The rural population pattern is, for the most part, denser than in 1755 and the village nucleations more pronounced. Despite the lack of the 1,000' contours, it is relatively easy to distinguish the upland areas from the population distribution pattern. It is interesting to find that, although a decline in population over 1,000' has occurred in Tweedsmuir, habitation above that level appears for the first time in the parishes of Drumelzier, Stobo, Broughton, Peebles and Eddleston. Many of these may represent shielings thought to be of too little significance to be marked on Roy's map, but some were of considerable size, for example in Eddleston. This may represent evidence of a continuation from the agricultural boom of the 1800s.

It is unfortunate that the built-up area of Innerleithen was too indeterminate on Thomson's map to be outlined on the dot distribution map, but the burgh's population is thought to have reached at least 300 by 1821. This figure has been deduced from the mapping of the parish population and would appear to be in accord with the first accurate burgh count in 1841 of 463. This being the case, Innerleithen

had expanded more slowly than Peebles town in the 66 years since 1755. The population of Peebles town increased by some 30% over the same time-span, apparently a result of its growing dominance as the administrative and market centre for the county. The built-up area, meanwhile, appears to have doubled in extent.

The inhabitants of Peebles in 1861 (Fig. 34) numbered some 11,408. The trend shows increasing numbers in the lower Tweed Valley and either maximum population or the beginning of decline in all other areas. An explanation of this pattern can be found in the balance between agriculture and woollen manufacture existing at this time. The mid-nineteenth century was the time of expansion of woollen mills from Selkirk to Peebles, and 1861 saw the start of large population increases in both Peebles town and Innerleithen. At the same time government subsidies were sustaining agricultural development and thus population retention by most rural areas. Peebles town itself had shown a steady rise of about 100 persons per decade since 1821 while the built-up area increased by 0.1 square miles. However, there was also a number of people in the immediate environs of the town, probably another 300. Innerleithen increased at the much more spectacular rate of almost 300% since 1841 with an equally large if not larger population fringe than Peebles town. The built-up area extended over 1.1 square miles. The village of Walkerburn, to the east of Innerleithen, was established about this time with the completion of Tweedvale and Tweedholm Mills in the late 1850s and from this period

to the present day, nearly all its inhabitants depend on the local textile industry for employment. Thus fluctuations in the population of Walkerburn are a direct result of the employment situation at the mills.

The rural landscape shows a population decline in the higher valleys with the parishes of Drumelzier, Tweedsmuir and Manor well past their maximum population of the 1821 to 1831 period. In each case a decrease of over 30% was registered. The parishes in the west of Peebles also recorded a waning population but at a slower rate. For the first time in 1861, the parishes of Broughton, Glenholm and Kilbucho were amalgamated and it should be noted that, as a result, the dot mapping of these three is slightly less accurate. However, their joint population decreased from 881 in 1851 to 723 in 1861. Throughout the county there was a decrease in the numbers living over 1,000'. Meanwhile the villages noted above increased in size, especially those of West Linton, Eddleston and Romannobridge, while Skirling village grew smaller and the Broughton nucleus was eclipsed by the loosely-knit community of Stobo estate and village.

By 1901 (Figure 35) the total population of the county of Peebles had risen to 15,066, an increase of over 30% since 1861. Almost all of this increase stems from the spectacular growth of Peebles town, Innerleithen and Walkerburn, a direct result of the establishment and growth of the woollen mills along the River Tweed and probably additionally influenced by the advent of the railways in the 1860s. Peebles town more than doubled its number of inhabitants

in the intervening forty years and had spread over 3.9 square miles. Innerleithen too had doubled its population, the actual built-up area occupying 1.2 square miles but with large numbers living on the outskirts of the town, while Walkerburn had expanded from very modest beginnings to a sizeable village of at least 500 inhabitants.

All non-urban areas experienced a decrease in population over the period 1861 to 1901 with the exception of the four parishes of Innerleithen, Manor, Broughton-Glenholm-and-Kilbucho, and Tweedsmuir. In the case of Innerleithen, population of both parish and burgh increased rapidly to 1891, then declined mainly in the burgh but also by some 100 persons in the non-urban zone. This decrease, in spite of an additive boundary change, has no logical explanation other than the contraction in agricultural employment in the rural area. Manor was undergoing fluctuations in its population during this time and continued to do so until 1931, resulting perhaps from its close proximity to Peebles town, only one mile distant from its border and three to four miles from the main population concentration. The population of the combined parish of Broughton, Glenholm and Kilbucho declined with increasing momentum to 1891, whereupon an increase of 60% occurred. One causal factor here appears to have been the boundary change which incorporated a large portion of the parish of Culter, Lanarkshire, with Broughton, Glenholm and Kilbucho (see Shennan 1892). Furthermore, the population total was inflated not only in 1901 but also in 1921 by an influx of navvies engaged on pipe-laying duties for

Edinburgh Corporation whilst by 1951 three hotels had opened and a scout camp was being held within the parish on enumeration night (Third Statistical Account, 1964) resulting in another increase of transitory inhabitants. This suggests that out-migration from the parish has been even greater than the census figures indicate. The parish of Tweedsmuir recorded a population increase in 1901 on a scale even more startling than that of Castleton, Roxburgh, in 1861, having more than doubled within a decade. The cause given in the Third Statistical Account (1964) is the inclusion in the enumeration of workers engaged on the construction of Talla Reservoir, a conclusion borne out by the presence in 1901 of an excessive proportion of males aged twenty to fifty-five. This source also draws attention to the presence here of a smaller number of workmen in 1951, employed on a Supplementary Water Scheme. These temporary inhabitants have been arbitrarily located on the dot distribution map round the only hotel in the parish. As to the general pattern of rural population distribution, no major changes are evident. It should be noted here that the detached portion of Lyne parish was transferred in 1892 to Yarrow in Selkirk, resulting in the halving of the population of the parish between 1891 and 1901. The villages of West Linton, Romannobridge, Eddleston and Skirling all appear to have diminished while Carlops in the extreme north has expanded. Above 1,000' the population has remained virtually unchanged although some depopulation has occurred in the more remote areas, for example within the parishes of Tweedsmuir, Eddleston and West Linton.

Changes between 1901 (Fig. 35) and 1921 (Fig. 36) are less remarkable. Although 1921 is the year of maximum population in the county of Peebles, the total population increased by only 2% to 15,332. This change is reflected in minor adjustments to the detailed population figures. In the case of the urban areas, Peebles town continued to flourish but Innerleithen had started on a downward trend which carries through to the present day. Already the woollen industry was in a period of recession, similar to that experienced in Selkirk, and several mills were either reducing output and manpower or closing down altogether. While Innerleithen experienced the full impact of this, Peebles was ready to diversify its economy by encouraging the growth of a tourist industry. However, since the 1921 census is said to be unreliable in that the enumeration was undertaken in June rather than April, one should find an excess of population in a tourist area. This is not so, as the enumeration figure shows a decrease of 15 over 1911 rather than an influx of population. It is reasonod then that one or more of several factors may have operated. First, the permanent inhabitants of Peebles town may have decreased in line with almost all other parishes of the county but this decrease is masked by an inflow of tourists. Secondly, the figure given represents a true enumeration in that there were few who would or could vacation in the immediate post-war period. Thirdly, tourism, as it is experienced today, had not started in 1921. However, it should be borne in mind that Peebles town with its two-hundred-room "Hydro" built

in 1878 was considered a fashionable watering-place, although the proliferation of holiday accommodation is of more recent origin. Furthermore, as the "Hydro" was used during the First World War as a Naval Convalescent Home, it is possible that this hotel was not available for tourist accommodation in 1921. In any event, the figure of 5,539 is only negligibly smaller than the total for 1911 and shows an increase of some 7% over 1901. The significance of this 15-person decrease in 1921 lies in the fact that the steady growth of Peebles town is interrupted for the first time since enumeration began in 1841 and it should be noted that the burgh expands once more in the "depression" period of 1931. In 1921 the built-up area of Peebles had almost doubled in area since 1901 to 6.2 square miles, while Innerleithen occupied some 2.0 square miles.

Away from the burghs and the parishes in which they lie, only three parishes show an increase on the 1901 figures although most had fluctuated in the intervening period. The three parishes where expansion occurred were West Linton and Newlands in the extreme north and Manor in the south. The former two lie athwart the broad valley between the Pentland and Moorfoot Hills, drained to the south by Lyne Water and to the north east by the River North Esk, thus forming a routeway which has proved more significant in recent times (see below). For West Linton, the 1921 census figure is the start of later growth, whereas Newlands shows only a temporary revitalisation of a population on the wane since 1811. The parish of Manor, on the other hand,

achieves maximum population in 1921. The population has increased in the northern and lower portion of the parish and contracted still further in the higher southern area, thereby emphasising the pattern already described for 1901 (see above). Any attempt to explain the 20% increase in population in Manor is problematical but it may be partially a result of the establishment of a sanatorium within the parish which closed in 1937 after a period of gradual decline. The population of all parishes not discussed above, with the exception of Kirkurd and Traquair, fluctuated in the period 1901 to 1921, some more markedly than others. In the case of Broughton, Glenholm and Kilbucho (already discussed), and of Drumelzier, Stobo, and Tweedsmuir, the higher return was made in 1921, while the parishes of Eddleston, Lyne and Skirling show expansion in 1911 although, as already stated, total numbers in 1921 were all lower than those of 1901. The causal factors for these changes are not clear but it appears likely that the increases were a result of temporary residents similar to those instanced in Broughton, Glenholm and Kilbucho. Apart from the Tweedsmuir anomaly, the general distribution pattern has changed but little since 1901 although minor depopulation is evident in some of the more remote valleys, as for example in Eddleston and Drumelzier parishes.

Between 1921 (Fig. 36) and 1951 (Fig. 37) the county population had fluctuated but at the end of the period the overall reduction was only 130 persons. A similar fluctuation is revealed in only four of

the constituent parishes, namely Broughton, Glenholm and Kilbucho for one, and then Skirling, Tweedsmuir, and West Linton. Such fluctuation may be expected during this period of depression in the 1930s, followed by the post-war "boom" with its attendant growth in the birth rate. In fact Peebles, like the rest of the Border Counties, has a smaller percentage of children and a higher percentage of over sixties than the national average (see Chapter III). Thus one finds that in many parishes there is a steady decrease in population from 1921. This is is exemplified by Eddleston, Innerleithen, Manor, Newlands, Stobo and Traquair. All are marginal parishes where agriculture, if it still thrives, does so by increased mechanisation instead of increased manpower. With the exception of Innerleithen, all lack a population nucleus of more than 100 persons which might have proved attractive for retirement, since almost the whole of Peebles lies within an hour's journey of Edinburgh. All these parishes provide evidence of a rural to urban migration. However, it is the remaining parishes which are exceptional and whose population figures are more difficult to explain. Drumelzier, Kirkurd and Lyne all show an increase in 1931 followed by a decrease in 1951. It is suggested that the changes demonstrated by these three parishes are not significant. In no case was the 1931 increase of more than 20 persons, while the ensuing decrease in each parish reduced the population to less than that of 1921. In terms of percentages, this involved increases of 2%, 7% and 20% respectively in 1931 followed by decreases of approximately 50%, 20% and 20%. The 20% increase in the parish of Lyne

represents an absolute change of 20 persons and it is suggested by Osborne (1966) that "since, in parishes with a very small population, a small absolute increase may produce a large relative increase ... care must be taken to avoid permitting such parishes to stand out as anomalies, thereby attracting undue attention."

The parishes not examined thus far are those containing burghs, namely Peebles and Innerleithen, and it is convenient to consider parish and burgh together. In the case of Peebles parish and town, the number of urban inhabitants has increased continually since 1921, though more rapidly in the first decade than in the last two, while the rural part of the parish has shown a slight decrease at each enumeration. The growth of the burgh may be explained by a movement from rural to urban environment with Peebles town gaining most by virtue of being the largest burgh in the county, and by the impetus given to the town by tourism and by its attractions for retirement. The built-up area too had spread to encompass some 7.0 square miles as compared with 6.2 square miles in 1921. Innerleithen on the other hand continued to decline, although the burgh's inhabitants increased by 2 between 1931 and 1951. This cannot be considered to have significance. The general decrease may be accounted for by the continued decline in the fortunes of the textile industry with nothing to replace it as a source of employment in the community. Indeed it may be that the decrease in the landward population of the parish gave rise to a movement into the burgh, thereby masking an even larger

migration to areas outwith the Border Counties altogether. Meanwhile, the built-up area of the town had remained static at 2.0 square miles. The greatest decrease in the rural population of this parish occurred, as might be expected, between 1921 and 1931 with a decline of some 11.3%, while the decrease between 1931 and 1951 was approximately 2%. It is apparent that the population of the landward area was affected detrimentally by the declining woollen mills in Walkerburn. The distribution map (Fig. 37) shows a general decrease in numbers of dots throughout the areas of dispersed population, whilst almost every cluster contracted, though few disappeared altogether. This shrinkage is applicable to the environs of Peebles town and Innerleithen as much as to the nuclei of the remoter valleys. The only exception is to be found in the village of West Linton, whose population increase can be attributed to the fact that it lies on the main Edinburgh to Biggar road and hence has become to a large extent a commuter village for Edinburgh. Meanwhile, most of the 30% growth of the parish was caused by the establishment in 1940 of Broomlee School, one mile to the south west of the village.

The pattern in 1961 (Fig. 38) has altered but little over the decade and only a few additional comments are necessary. The total population of the county decreased by just over 1,000 to 14,156, revealing a trend already prevalent in the other three Border Counties. Only four parishes increased in population during this period, viz. Crumelzier and Eddleston by 4 persons each, Kirkurd by 12 and Skirling by 40. Only this last seems noteworthy and is most likely a result

of its location within easy commuting distance of Biggar. As may be seen from Figures 37 and 38, the increase is to be found in the village of Skirling itself, while the north-western portion of the parish appears to be losing population. All other parishes lost population at this time but in no instance by an excessive amount; the pattern rather has been a gradual decline, if one that is increasing in momentum. West Linton again proves an interesting anomaly. Taking into account the fact that Broomlee School decreased by 42 inhabitants, the rest of the parish increased by 36, most of which number is revealed as a further expansion of the dormitory village of West Linton. The town of Peebles meanwhile seems to be losing favour or conversely increasing in popularity as a seasonal attraction only, since its resident population declined by some 12%.

4. Conclusion

This analysis as a whole has sought to relate change in the spatial distribution of the Borders population to the physical, social and economic environment over a two-hundred-year period at both county and parish level. The wealth of detail brought to light by this investigation cannot be summarised in a few short sentences. However, three major conclusions may be drawn.

The careful deliberation over the choice of technique used to map population distribution has resulted in a series of maps which are

comparative over a two-hundred-year time-span. Furthermore, these maps are sufficiently detailed and accurate to act as base maps for other research studies such as nearest neighbour analyses.

The 1,000' contour has proved to be a valid datum line against which to measure the upward spread of population associated with increasing intensity of land use in the Border Counties. With the exception of the upper Tweed Valley, the land above 1,000' was generally found to be inhabited only during the period of maximum rural population in the early nineteenth century.

A continual rural to urban movement has been revealed and discussed in all four counties and is best summarised by reference to Table II.2. Here, lack of data requires the urban population to be taken as equivalent to burghal inhabitants. These percentages should therefore be treated with caution if used for comparison with other areas, although they permit comparisons to be made within the present context. It can be seen that a pattern of burghal growth relative to total population is common to all counties. However, the scale of this growth highlights the importance of specific economic influences on the population distribution of the Border Counties.

CHAPTER III

POPULATION CHARACTERISTICS

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POPULATION CHARACTERISTICS

The analysis undertaken in Chapter II constitutes an attempt to describe and explain the changing distribution of population in the Border Counties since 1755. It has shown where and on what scale depopulation has occurred and tentative suggestions as to the cause of this depopulation have been offered. However, the writer has become increasingly aware that this study, whilst making a vital contribution to the understanding of the problem, marks but the beginning of the investigation into the main theme of this research — the causes and consequences of Border Counties depopulation — and the focus must now turn from the gross and general aspects of the population as a whole to the specific and refined characteristics of its individual members.

In theory, the range of attributes capable of being studied by the geographer is almost limitless. In any single piece of research work, therefore, a deliberate selection of individual characteristics worthy of detailed examination must be made on the grounds of relevance to that research and availability of data. In order to simplify this task of selection, population characteristics have been subdivided into three conventionally recognised categories — physical,

economic and social.

Within the first category, a wide variety of factors may be considered such as age, sex, colour, race, intelligence, morbidity, height and weight. Of these, age and sex have been selected as of paramount importance in the current study because of their close inter-relationship with fertility, mortality and migration, the components of population growth. The ethnic variables are of little significance since variations in these are a rarity in the Border Counties, while morbidity, although discussed in conjunction with mortality in Chapter IV, is not sufficiently relevant to the depopulation of the study area to warrant separate analysis at this point. Lack of data precludes analysis of intelligence, height and weight, although it has been suggested that these factors may be associated with migration in other areas. For example, the correlation between intelligence and rural out-migration in England and Wales is discussed by Saville (1957, pp. 127-130), while the relationship between weight and seasonal hunger in North-East Ghana is examined by Hunter (1967).

The category of economic characteristics includes a much smaller range of subdivisions, namely occupation, employment and income. The analysis in Chapter II suggests that all three may be strongly associated with population change in the study area and detailed investigation of these characteristics appears justified. Unfortunately, Scotland lacks the wealth of data on income which is available in other countries, notably the United States, and statistics can be

obtained at national level only. Thus an examination of the income differential was found to be impracticable. However, occupational composition and levels of employment are subjected to a detailed simultaneous analysis, although the quality of available data is far from optimal.

The largest category of population characteristics is of a social nature and covers such factors as marital status, family, household, literacy, education, language, religion and nationality. Some of these characteristics are of so little account in the Border Counties that consideration of them is unwarranted. For example, the only language other than English for which data can be obtained is Gaelic, and in 1961 the number of Gaelic-only speakers in the four counties amounted to six, a maximum for the period since 1891. With other characteristics, problems of paucity of data are so great as to render worthless any analysis over the time period under consideration. Such is the case with religion and literacy, the significance of which is dubious anyway, in the present context. However, the three characteristics of age, sex and occupation, already singled out for analysis in depth, are each influenced by, or exert influence on, several of these social traits. Thus age and sex proportions, through fertility, may be linked with marital status, education, religion and family size, whilst correlation may be shown between occupation and family size, literacy, nationality, and even religion (see Crespi, 1963). Therefore, since these characteristics are so

intricately inter-related, it is suggested that the most profitable approach would derive from an investigation of the relevant social attributes in conjunction with the factors of age, sex and occupation.

1. Patterns of the Age/Sex Structure

The age and sex variables are often called the "demographic traits" because they form the basis of a population model which is the principal subject-matter of formal demography as defined by Petersen (1969) and because of the very close relation they have to the study of population growth. The age/sex composition of a population at a given instant has a substantial influence on the capacity or potential for population growth in future years. The study of age and sex is of paramount importance to any consideration of population dynamics since its structure sets the future rates of fertility, migration and mortality. Thus a young population — that is one in which young people are relatively more numerous — is likely to be more fertile, more migratory, and less susceptible to most causes of death, than an old population.

On the other hand, it is equally valid to regard the age/sex composition of a population as an effect rather than a cause. In this case, the present structure is considered to be determined by the growth trends of the past and regarded, in part, as a residue of past dynamic processes. This two-fold relationship, where the

age/sex structure is simultaneously a cause and an effect, is an intricate one. Clarke (1965) suggests this as the reason that its study has been so frequently neglected by geographers. He goes on, "Too often statements are made about population growth in absolute numbers without reference to changes in age-structure"(p. 63). Further illustration of this point may be found in the plethora of papers in geographical journals following the publication of each successive Census and attention is here drawn to the fact that such papers make only passing reference, if any, to the population characteristics involved in such changes as occur in the intercensal period. Bogue (1969) considers that social scientists tend to dismiss the age and sex variables as being of lesser importance because they are intensively studied by demographers. Clarke and Bogue agree, however, that there is scarcely any aspect of individual or communal life which is not related to age and sex either as cause or effect. It would be equally valid to accept either but it has been decided in the present analysis to concentrate on the first point of view and to study the age/sex structure as an active factor. The chapter on population dynamics will give a more detailed explanation of the processes that modify these structures.

Dependent upon which method of data presentation is employed, the age and sex structures of a population may be analysed conjointly or separately. In the present study, the age structure will be examined first in general terms, age and sex will then be studied

together and in greater detail, and finally the sex structure will be analysed separately on the basis of areal and temporal distributions of sex ratios and jointly with age by means of age-specific ratios.

The data used in this section have been taken from the Censuses of Scotland and are therefore subject to certain inaccuracies, while the analysis itself is inevitably restricted to the confines of the statistics available. Statistics on sex are usually the best in any demographic record. There is no ambiguity about the meaning of male and female and seldom any motivation for misrepresentation. Moreover, since sex is usually the first breakdown of an enumeration, the statistics tend to be historically complete. Thus, while there was no such breakdown in Webster's head count (1755), data on sex are available in every Census from 1801 to the present day.

Age statistics are also relatively accurate and complete although less so than could be desired. No question on age was asked in the 1801 Census of Scotland; in 1821 the question was included but answers were required only "if not inconvenient"; in 1831, an estimate was made of the number of males aged twenty years and over, and it was not until 1841 that a statement of age was compulsory. However, the statistics then collected are published in quinquennial groups to the age of twenty and decennial groups thereafter. In order to arrive at a percentage aged 65 and over for this date, an estimate of the 65 to 69 age-group was computed on the basis of the 1851 proportions of this age in each county in the study area to the 60 to 69 age-group as a whole. Since 1851, age statistics have been

published in quinquennial groupings.

A very real difficulty can arise from known errors in census data. The two most common are that returns for females tend to be less accurate than those for males and that "heaping" may occur especially at even numbers and those ending in five and zero.[1] An investigation of the probability of such errors in the Census of Scotland was conducted by the Registrar-General in 1961. Extensive and elaborate cross-checking was made of a 10% sample of the county of Roxburgh. It was found that, at this date, there was no evidence of "heaping" at any specific ages and that, of the 1750 males cross-checked, 68.7% reported their ages accurately, while 68.8% of the 1835 females examined did so. Most ages inaccurately reported were mis-stated by one month only and few by more than one year. Thus, although earlier censuses are probably less accurate, such errors are unlikely to constitute a source of difficulty in the current study where the basis of cohort grouping is on a minimum time-scale of five years.

A further difficulty experienced was that of the changing areal basis upon which the enumeration was taken. Until 1881, the age statistics refer to registration districts and not civil districts. The reason for this given by the Registrar-General in the 1861 report was that "the sole value of the Tables depends on their being drawn

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1. An extreme illustration of this is cited for Turkey by Bogue (1969), p. 105).

up so as to be comparable with the Registrar-General's Returns of Births, Deaths, and Marriages". In order to allow comparisons between these and later figures which were published for civil districts, age-groups were computed as percentages. However, one alteration of the census statistics as published was deemed necessary. That was in the case of Roxburgh and Selkirk in 1871 where the registration district of Ladhope — that is, part of Galashiels — was transferred from Roxburgh to Selkirk between publication of Parts 1 and 2 of the Census. The figures have been recalculated with the effect that Ladhope remains in Roxburgh for all statistics pertaining to 1871. As before, however, no attempt has been made to compensate for any of the other boundary changes.

The Age Structure

Age data may be presented in a variety of different ways and each of them was examined in respect of their applicability to the aims of this thesis. These methods fall into four categories: age groups, divergence graphs, indices, and pyramids. Grouping ages into three classes is a common approach and one which reveals, over time, the general trend of the age structure. Here the total population is divided into the 0 to 14 group, the youthful sector which is largely non-productive and non-reproductive; the 15 to 64 group, adults who are reproductive and productive, supporting the bulk of the other two groups; and the 65 and over segment, the aged

who are again most probably non-productive and non-reproductive. The proportions of these three groups to the total population have been calculated for each census enumeration since 1841 and are shown in Tables III.1, III.2 and III.3 respectively. Initially it was hoped to portray these in graph form, but this was found to be impracticable except by excessive vertical exaggeration. Divergence graphs were equally unsuccessful in revealing on the same graph the county trends as against the national average. Triangular graphs too were obviously unsuited for the purpose in hand.[1]

A variety of age-indices were considered in order to further this analysis. A number of these, enumerated by Clarke (1965), are designed to give a clearer picture of the relationships of the three age-groups. The most common, the dependency ratio, is used to measure the impact of age composition on the livelihood activity of the population. It is assumed that the 15 to 64 group is the productive segment of the population and that those under 15 and over 64 are the dependent segment. The ratio purports to measure how many dependents each 100 persons in the productive years must support and is computed thus:-

$$\text{Dependency Ratio} = \frac{\text{children (under 15)} + \text{aged (over 64)}}{\text{adults (15 to 64)}} \times 100$$

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1. Dewdney (1968) mapped age groups for 1961 on an areal basis for over 2,000 administrative areas of the British Isles. The problems he encountered are manifold both in mapping and in interpretation and are discussed in his accompanying paper. However, attention is here drawn to the existence of these maps in that they represent one of the few analyses which include the Border Counties and may provide a useful source of additional information.

This is only an approximate measure in that not all adults are economically active nor are all the aged retired. Nevertheless, this ratio is highly useful because only age statistics are required and it can therefore be calculated for areas and periods for which employment statistics are unreliable or non-existent. Moreover, as Bogue (1969, p. 155) suggests, "it points out fairly precisely the same differences and reports their comparative magnitude in about the same way as does a more refined measure". Its greatest advantage is that it provides a measure which allows direct comparisons to be made over time and space. The dependency ratio has therefore been computed for each of the Border Counties and for Scotland (Table III.4) not only for use in studying the age structure but also as an additional tool for the analysis of the occupation composition later in this chapter.

One further index was examined for possible use, the age structure index as developed by Coulson (1968). This index is in fact the regression coefficient computed by plotting the percentage of the population in each age-group against the middle age in each quinquennial age-group and measuring the angle of the slope on the simple regression line thus formed. The most important feature of this index is that, being a single value, it may be used in correlation analysis to examine the relationships between age structure and other demographic variables. Coulson, however, was working in the United States where detailed statistical data are available from the census for small-area units. Such information is not published in

the Scottish censuses where, for the most part, the smallest area for which comparable data can be obtained is the county unit, and even so, some of the independent variables which he suggests for correlation purposes are not available at all, such as median family income. Nevertheless, taken at parish level, certain of the tests could be made for the mid-nineteenth-century period when census publications were more detailed, and this might prove an interesting and valuable avenue of further research.

Tables III.1 to III.4 provide a general historical trend of the age composition of the Border Counties which may be compared with the national average. The patterns of change shown here display broad similarities, illustrative of trends common to most Western countries, although several interesting anomalies occur.

The proportion of children shown in Table III.1 increases until 1871 in every case except Selkirk. The percentages run very close to the national average with high numbers of children to be expected at this time since a low percentage in the aged group is usually accompanied by a high birth-rate. Moreover, until 1861 the population was increasing and the economy expanding in all four of the Border Counties. The economy at this time was based largely on agriculture and it is seen that the county least dependent on agriculture, Selkirk, is the one which deviates most from the norm. In Selkirk, the proportion of children decreased steadily from 1841 until 1871, but this was followed, in 1881, by a marked increase.

The boom in textile manufacture at this time resulted in large-scale immigration, almost doubling the county's population. The immigrants were mainly young families and the effect on the age structure was still apparent in 1891 when Selkirk retained the highest proportion of under 15s of the four Border Counties and only 0.4% less than that of Scotland as a whole.

Since 1871 in Berwick, Peebles and Roxburgh and since 1881 in Selkirk, there has been a continuous decrease in the proportion of children until 1931, slow at first but gaining momentum in the twentieth century. The rate of decrease has been much more rapid in the Border Counties than in Scotland, especially between 1901 and 1921. Added to this, there must be taken into account the nationwide fall in fertility over the period which has far outweighed any benefit accruing from the decline in infant and child mortality. The decrease in the percentage of children reaches phenomenal proportions in Selkirk in 1951 where 19.7% was recorded, almost 5% lower than the national average. The decline was only marginally smaller elsewhere. It should be remembered that this occurred at a time when other parts of the country were experiencing the effects of the post-war "baby boom". The most important factor would seem to be the extremely low fertility rate of the Border Counties, lower in fact than any other part of Scotland. The average family size (3.00 in Selkirk, as opposed to a national norm of 3.39) is correspondingly low while the proportion of non-childbearing women is high. This is probably

an outcome of the textile trade which employs not only a large number of women but, significantly, a high proportion of married women who, it appears, prefer to work and not bear children. The 1961 figures show some amelioration but more recent sample figures and estimates suggest that this is only a temporary arrest in the general decline.

The adult age-group (Table III.2) is often referred to as the active segment of a population. Although the 15 to 64 definition conforms to some statistical and legal conventions, in several respects it overstates the actual size of the economically active group. Few outside this age-group perform productive roles, but many in it do not, especially married women, students over 14 years of age, the chronically sick or disabled, and those who retire before the age of 65. Thus, this age-group is rather an estimate of the labour potential, the figure to which the labour force might expand during a period of national emergency.

The historical trend in the adult age-group in the Border Counties has been one of increase until the 1930s with a decade of decline in the 1870s in Berwick, Peebles and Roxburgh but building up again by 1881 in each county to exactly the same proportions as that of 1861. The course parallels that of Scotland but deviates from the national average in the rate of growth in the post-1891 period. Until 1901 the percentage of adults differed little from that of Scotland, but from that time until 1931 it has climbed well

above, especially in the predominantly industrial economies of Selkirk, Roxburgh and Peebles. The more recent figures for 1951 and 1961 show a decrease in the percentages of adults both at national and at Border Counties level but again, the rate of change is faster in the study area, falling to as much as 2.9% below the mean at the later date. The implications of this pattern will be discussed in conjunction with the dependency ratio below.

Table III.3 shows the proportions of the aged sector, those over 64 years of age. In common with most Western societies, it can be seen that in Scotland, both the proportion and the absolute number of elderly people have been increasing fairly steadily over the 120-year period since 1841 and at the end of that time had more than doubled. The cause is not hard to find, being almost entirely the consequence of improvements in death control. However, because the decline in mortality has been greatest among infants and children, the larger proportion who remained alive has in fact retarded the ageing of the population. Much has been written on the problems of ageing (Clarke 1965; Sauvy 1954; Valaoras 1950). In response, Notestein (1954) observed: "Viewed as a whole, the problem of aging is no problem at all. It is only the pessimistic way of looking at a great triumph of civilisation." Nevertheless, this "triumph of civilisation" has many social and economic implications, especially in an area such as the Border Counties where the proportion of aged

is so high. With the exception of Berwick, which has always had an above-average percentage of elderly, the position appears unremarkable when compared with Scotland until the turn of the century. Indeed, in conjunction with the expanding textile industry and the rapidly increasing population, Selkirk's proportion of old people was up to 2% less than that of Scotland. However, after the 1890s peak of industrial expansion, the rate of growth in the aged sector alters dramatically and the proportion of aged has trebled in the space of 70 years. The causative factors, other than the nation-wide increase in death control, would seem to be largely rooted in the pattern of migration. Out-migration has taken place mainly among the younger element of the population, leaving an ever-increasing proportion of aged, especially so when such a movement is linked with a low fertility rate. Moreover, such in-migration as has occurred has been chiefly among those of retirement age, many returning to their county of birth (see Chapter IV).

The meaning and value of the dependency ratio has already been discussed earlier in this chapter. The significance of the patterns revealed by Table III.4 must now be examined. The general trend has been one of increasing dependency to 1871, decrease to 1931, followed by a fairly substantial rise to 1961, with the difference once more occurring in rate rather than pattern of change. Table III.4 reveals that a county as heavily dependent on agriculture as Berwick is less susceptible to rapid change than one like Selkirk where economic

reliance is placed upon a single manufacturing industry.

Since the dependency ratio measures the burden which the active population must support, it might be supposed that a low dependency ratio is desirable. However, this is not necessarily the case, since the minimum dependency load, in the long term, is that obtained when the population is barely replacing itself, while population growth always implies a higher dependency burden. Thus the optimum dependency ratio would appear to lie at neither extreme but is itself dependent on what is considered to be the desirable state of population development at a given time and in a given social and economic environment. In the case of the Borders, the period of population growth is characterised by an increasing dependency ratio and such a situation is healthy in an expanding economy. With recession, the dependency load decreased to become, fortunately, very light during the depression years of the 1930s. The current situation, however, gives cause for some concern. Although the population numbers are remaining fairly static and even decreasing, the dependency burden is rising alarmingly, in the case of Peebles by almost 20% in thirty years.

In order to analyse the age structure in greater detail and to introduce the sex differential, age/sex pyramids have been constructed to portray the situation at five separate periods (Figs. 39-43). The years chosen for detailed examination correspond with those in the time-series studies of other demographic variables. However, pyramids for each of the four counties representing two other census

years, 1871 and 1931, may be consulted in Mears (1949, Plate 43). These are not strictly comparable since they have been constructed on an absolute number rather than on a percentage basis. In this thesis, the comparable method of pyramid construction based on percentage values has been adopted in order to reveal more clearly the areal and historical differences. Each male quinquennial age-group is expressed as a percentage of the total male population and similarly each female cohort as a percentage of the total female population. This procedure was considered preferable to taking the whole population as 100% since the sex differential is analysed by means of the sex ratio later in this chapter.

The age/sex pyramid, the conventional and probably the commonest method of examining age structure in conjunction with sex composition, offers several advantages. The frequency of its use permits ready comparison to be made with areas studied elsewhere by this method. In the present context, however, the purpose is to allow a more detailed analysis of the age structure, for age pyramids not only reflect long-term trends in fertility and mortality, but are also sensitive to the shorter-term effects of wars, migrations, epidemics and similar phenomena. At each point in time, the pyramid for Scotland has been constructed to provide a reference model in the form of the national average. Thus the comparison derived is threefold: on an inter-county basis, at an intercensal level, and comparability with the norm for the given period.

The 1861 series of pyramids illustrates the age structure at the time of maximum population in Berwick and Roxburgh, when large numbers were supported by a thriving agricultural economy. Figure 39 reveals a "progressive" type of population structure with a broad base resulting from a high fertility rate. The overall slope and shape of the pyramids correspond very closely with the national average, especially in the case of females. On the male side, only Roxburgh follows the Scottish pattern exactly. In the other three Border Counties, while the broad base is generally maintained to the age of 20, especially in Selkirk, there occurs a marked decrease above that age. Since this feature is seen most clearly in the agriculturally dominated counties of Berwick and Peebles, it suggests that sex-selective emigration was already taking its toll of young male adults, the effect being offset to a greater extent in Roxburgh and Selkirk by the presence of alternative employment opportunities in services and industry.[1]

By 1891 the regional differentiation of the Border Counties from the Scotland norm begins to be revealed. The first point of divergence is found in the 0 to 4 cohort. Here there has occurred a nation-wide decrease but, while it remains the largest percentage group in Scotland as a whole, this is not the case in any of the Border Counties. This lower birth-rate is most likely a direct

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1. For corroboration of this point, see below, p. 135.

result of the second divergent feature, that of young male adult migration, now a predominant factor in all four counties and accompanied by young female out-migration in the case of Berwick. The age most affected lies within the 20 to 45 range. Thus, while Scotland retained the potential for natural population growth, in the Border Counties the trend towards depopulation was already initiated, unless averted by a reversal of the migration flow.

Figure 41 shows that such a reversal did not occur, but that the effects of out-migration were in fact heightened by other factors. The nation-wide fall in the birth-rate occasioned by the first world war depressed the 0 to 4 age-group even further. Alarmingly small percentages of females are seen in this age-range, especially in Roxburgh and Peebles where they represent smaller proportions than in any other cohort to the age of 50. The main effects of this are witnessed in the 1940s as this cohort reaches reproductive age. As noted earlier in this chapter, the Border Counties did not experience the full impact of the post-war "baby boom" and the birth-rate remains the lowest in the country. The low percentages in the 20 to 30 male age-group could arise from a continued out-migration, but this is undoubtedly emphasised by the high number of casualties during World War I. In Roxburgh, a slight "waisting" is apparent on the female side in the 30 to 34 age-group and may be caused by an outward movement of women, accompanying husbands of the same age-group. The Berwick and Selkirk male age structures reveal a marked similarity to that of

Scotland apart from the slightly higher proportions in the older segment (over 45). The female sector differs widely however in the case of Selkirk where, except for the under-10s, the pyramid depicts a healthy "progressive" type of slope. The cause of this must lie in the employment structure of the county in which opportunities in the textile industry are added to the country-wide female labour requirements on the land in time of war. Galashiels' reputation for the production of material suitable for soldiers' uniforms meant that the looms were in operation round the clock, providing employment for relatively large numbers of women. The repercussions of the post-war recession have not yet had time to affect the female age structure of the population.

The major change which has taken place since 1891 is a decrease in the percentages under 30 with a corresponding increase in those over 30. The main difference between the national picture and the Border Counties is found in the quinquennial age-group at which the decrease ceases. For Scotland, this age is 29 among males and 24 on the female side, but in each of the Border Counties this is reversed, illustrative of the fact that male emigration at the turn of the century was apparently equivalent in numbers to war casualties. Proportions increase to a greater degree in the Border Counties, especially between the ages of 40 and 60, than they do at the national level, revealing that by 1921 the population of the four counties was ageing more rapidly.

By 1951, proportions of males had undergone further decreases up to the age of 24 in all areas while the decline in female percentages had extended to age 34 generally and to 44 in Roxburgh and Peebles. These decreases are offset by increases above those ages. By far the largest percentage rise was in Selkirk among females aged 50 to 79. It would appear therefore that there was no large-scale out-migration of women during the 1930s and 1940s and that the high proportions of young females noted in 1921 were not replaced by others. While increases among the older adults and aged were general they were not as large within the four counties as in Scotland as a whole.

Several demographic details are revealed by the age/sex pyramid for 1951 (Fig. 42). The first is found in the broad base to all pyramids resulting from the post-World War II "baby boom", most of which, dating from 1947, is found in the 0 to 4 age-group. Secondly, the low proportions found in the 5 to 24 segment are attributable to the low birth-rate occasioned initially by the depression years of the early 1930s and then by World War II. The 30 to 39 cohorts have been reduced by the low birth-rate during World War I and its effect heightened to a certain extent by the casualties between 1939 and 1945. The typical pattern which resulted from these causes is reflected by all the pyramids to a greater or lesser degree. Only Peebles reveals a feature not yet taken into account, namely the increased proportion in the 10 to 14 cohort arising from the presence within the county of

Broomlee residential camp, which in 1951 housed 303 persons, the majority of whom came within this age-group.

Changes between 1951 and 1961 are obviously less remarkable because of the shorter time-span. In Figure 43 there is apparent, however, a nation-wide decrease in the proportions of both males and females between the ages of 20 and 49. As this represents the young, active and reproductive sector of a population the repercussions are serious, particularly so in the Border Counties, where out-migration has been a prevalent feature for the best part of a century (see Chapter IV). The effect on the pyramid shape is evident. Whilst "waisting" of the age/sex pyramid for Scotland is only incipient, it is already a well-developed feature in those of the Border Counties. The increase resulting from the post-war rise in the birth-rate, now represented by the 10 to 14 cohort, was only a temporary phenomenon and, as such, gave rise to more problems than benefits. The greatest problem was probably that experienced as the "bulge" was launched upon the labour market. In the Borders, this could scarcely have happened at a worse time in the area's history, following the recession in the textile industry in 1958 and the reduction of the agricultural labour force between 1953 and 1963 by 23% owing to increased mechanisation. The 10 to 14 age-group is again accentuated in Peebles because of Broomlee Residential Camp. All four counties are marked by high percentages in the over-50 sector, especially among females, although this is to be expected on account of their greater longevity.

However, this is not solely the result of an out-migration of younger adults but also to an appreciable inward movement of elderly and retired people, a possible gain of up to 10% (Scottish Office 1966). Those movements will be examined in more detail in Chapter IV.

The Sex Structure

As has been seen from the foregoing, it is impossible to separate age from sex in any analysis and, indeed, it would be undesirable to attempt to do so. However, the construction method of the age/sex pyramids used in Figures 39 to 43 was chosen deliberately to reveal features of the age pattern within each sex rather than to provide comparison between them, since such is the aim of this section on sex composition.

Although the numbers of the two sexes are not widely divergent, their disparity is of interest to geographers because of the contrasting roles of the two sexes in economy and society. The chief method of studying the sex differential is the sex ratio. This measure may be expressed in a variety of different ways but the one adopted for the current study, that of number of females per 100 males, corresponds to that used in the Census of Scotland. This examination of sex composition by sex ratios is undertaken at three levels. The historical trend is first studied by means of a graph depicting the changes in county ratios over the period 1861 to 1961

in comparison with the national average (Fig. 44). The variations in areal patterns is shown in Figures 45 to 51 where sex ratios have been calculated at parish level and at thirty-year intervals. To complement these studies of crude sex ratios, age-specific ratios have been computed for the Border Counties and for Scotland, again at thirty-year intervals but dating only from 1861. These are given in Tables III.5 to III.9.

Few studies of patterns of sex ratios have been published and none, as far as the author has been able to ascertain, pertaining to Scotland or any subdivision of it. This neglect extends not only to geographers but also to demographers and planners. For example, the authors of "The Central Borders: A Plan for Expansion"(1963) pay scant heed to sex differentials. Yet Franklin (1956) considers that "in interpreting the regional aspects of the sex ratio, one is able to integrate a considerable amount of other regional information". Clarke (1960a) states that although sex composition owes little to geographical environment, it "owes much to social and economic factors and also has profound social and economic implications".

In general terms, the number of females per 100 males usually varies between 90 and 110. In common with most West European countries, Scotland has a marked majority of females, a ratio of 108.6 in the 1961 census but ranging from a peak in 1811 of 118.5 to a minimum in 1901 of 105.7. Such oscillations are generally recognised as results of three distinct factors. These are the

preponderance of male births, the different mortality of the two sexes, and selective migrations (Clarke 1960a, 1965 and 1965a; Saville 1957; Bogue 1969).

It is a characteristic of most mammals, including humans, that the sex ratio at birth shows an excess of males. However, this initial surplus is soon reduced by the heavier mortality among male babies and children. Bogue (1969) states: "As a result, the excess of males that exists at birth is gradually dissipated until by ages 30 to 50, the numbers of males and females are about equal and beyond age 50, females definitely outnumber males. The result is that in most populations there is a slight majority of females." However, as Bogue recognises, this condition is not universal for no account has yet been taken of the third major factor, migration, which is more often than not sex-selective. Thus, where the migratory sex is largely male, as has been the case involving long-distance movement, the area of in-migration shows a low sex ratio[1] whereas the tendency for a majority of females in increased in the zone of out-migration. There are, however, several other minor, local or temporary factors which may affect the sex ratio. The extent to which all of these factors have influenced the patterns of sex ratios in the Border Counties in relation to Scotland as a whole will now be discussed.

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1. By earlier definition, high and low sex ratios mean high and low proportions of females to males.

Figure 44 shows the changing trends of the sex ratios of each of the four Border Counties in relation to the national average between 1801 and 1961. The average pattern is fairly clear as one of initial high numbers of females in proportion to males, decreasing relatively steadily to the end of the nineteenth century and increasing gradually again to the mid-point of this century. It is probable that this initial female preponderance was overstated somewhat in the censuses of 1801 and 1811. In these years, the absence abroad of large numbers of men serving in the armed forces artificially increased the female proportion in the total population, but Saville (1957) estimates that the difference involved cannot have been much more than 1%. It is likely too that this difference may well have been offset by defects in the early statistics. For example, the under-registration of births is known to have been greater for girls than for boys and this may have been paralleled by female under-enumeration in the censuses. The Border Counties appear to have been influenced by few common factors and the graphs are found to be extremely sensitive to local conditions. The exact nature of localised and temporary imbalance between the two sexes will be revealed by the more detailed analysis of the areal patterns later in this chapter. Some general trends can be observed, however, and certain parallels drawn.

First, the Berwick trend follows the national average remarkably closely, never deviating from it by more than 5.8 females per 100 males. Secondly, the trends for each county show wide variations

until 1861. Since that date, Selkirk and Roxburgh have shown a steady rise in the ratio to a peak in 1921 of over 122 whereas the increase in Peebles, whilst quantitatively as great, is more erratic. This coincides with the 1870s boom in the textile industry in all three counties and the corresponding increase in source of employment for women until 1891. The recession in textiles at the turn of the century alters the course of the graphs until military casualties in World War I takes over as the main cause of imbalance. Since 1921, all these counties have shown decreasing sex ratios, the greatest decline being experienced in Roxburgh where a healthier balance in the economy has been maintained in recent years with greater opportunities for male labour. In the decade since 1951, only Berwick has shown an increasing sex ratio, an anomaly for which no logical explanation can be found.

In order to examine more closely the factors involved in these trends, it is necessary to look first at the age-specific sex ratios. Although the Registrar-General has calculated some of the ratios for 1921 and 1951, most have had to be computed from the raw sex data and are shown in Tables III.5 to III.9. Obviously these tables can only be compiled from the date of the first age statistics. Thus no age-specific sex ratios are available for 1801 and 1831 but, as in the case of the age/sex pyramids, date from 1861.

Each of the Border Counties and Scotland show an excess of males over females at birth throughout the time-period with the

exception of Peebles in 1921 and 1961 where ratios of 100.9 and 110.4 respectively were recorded. Recently masculinity at birth has increased. According to Clarke (1960a), the phenomenon was observed in several counties after the first world war, giving rise to the old wives' tale that this was "nature's way of compensating for the appalling loss of males in the great conflict". Daville (1957, p. 93) records that the upward trend dates from about 1905 in England and Wales whilst in Scotland the figures demonstrate increasing femininity at birth to 1921. Furthermore, in the Border Counties, only Selkirk shows a rise in the proportion of males in the 0 to 4 cohort in 1921. However, the 1951 and 1961 figures do reveal a general trend toward greater masculinity in this age-group in Scotland. The cause of this is still a matter of some controversy but may result from a number of factors. Martin (1955) suggests that "the ratio of male to female births is correlated with the age of the mother; a young woman has a greater chance than an older one of producing a male birth. During major wars, the average age of women at marriage falls, with a consequent fall in the sex ratio at birth." Callahan(1951) on the other hand contends that "there is a greater tendency for the first born child to be male than for later born children", and concludes that the increase in the proportion of first births during World War II was the prime cause of the lowering of the sex ratio. Others suggest that, owing to the absence of their husbands during the war, wives, free from frequent pregnancies, were

healthier and thus lost fewer still-born male babies than in normal circumstances. However, since the proportion of males to females amongst stillbirths exceeds that amongst live births, it would seem that the decline in stillbirths as a result of advancing medical knowledge would have increased the proportion of males to females amongst live births with or without the intervention of war. Certainly, the improvements in health, pre- and peri-natal care and the rising standard of living have resulted in a decline of stillbirths and therefore of the sex ratio at birth. Clarke (1960a) believes that "a more obvious cause for masculinity at birth, is the desire for sons and the completion of families on the achievement of a son". He does not explain, however, why this desire should increase in an immediate post-war period.

Male mortality is higher than female mortality in almost every age-group as a result of both environmental and biological factors. The initial excess of males is generally rapidly reduced because, biologically, females are more resilient than males. As can be seen from Tables III.5 to III.8, the male surplus is largely eliminated by the age of fifteen although local anomalies do occur: witness Selkirk in 1921. By 1961, Table III.9 shows, it would seem that the reduction in mortality rates has become so great that the excess of males is generally extended to age 20, and even age 25 in the case of Berwick. However, other factors are probably in operation such as the increasing tendency to continue education after the age of 15,

thus postponing the outflow of males by emigration until a later age, and the probability that, with the 1958 recession in the textile industry, out-migration has become less sex-selective.

After the age of 15, the environmental factor tends to assume control in male mortality with men being exposed to greater risks at work as well as in war. Nevertheless, this alone cannot explain the immense increases in the sex ratios between the ages of 15 and 25. In 1861 (Table III.5) the national figures reveal a rise in the sex ratios from 119.9 in the 20 to 24 age-group to 130.0 in the 25 to 29 cohort. This, according to contemporary commentary in the Census of Scotland, is a direct result of male emigration, a feature which had been operating for several decades but increased in momentum in the 1850s. The state of imbalance by that date was so serious that the then Registrar-General felt obliged to advocate the encouragement of female emigration (General Report 1861, p. xi). From the statistics for the Border Counties, it would appear that much of this male exodus was taking place from rich agricultural areas where mechanisation and amalgamation of farms was resulting in redundancy. Thus, while females exceed males in the 15 to 19 age-group in Scotland and in Berwick, the reverse is true in Peebles, Roxburgh and Selkirk. Peebles and Selkirk do show higher sex ratios in the older age-groups but Roxburgh remains remarkably near parity. By 1891 the position is reversed with male dominance to age 20 in Scotland and Berwick and an increasing proportion of females in the other three counties. Here

the ratios rise dramatically to 156.7 in Selkirk in the 25 to 29 cohort corresponding to the period of high demand for female labour by the textile industry in the 1880s. The fall-off in the older age-groups is equally dramatic to about the national average by age 45. In 1921 the female excess in the 20 to 25 age-group may be explained, in the case of Scotland, as a result of casualties, chiefly male, in the first world war. The effect of war losses was not as devastating, however, as the mass male exodus of the 1850s, nor can it account for the excessively high ratios seen once again in Peebles, Roxburgh and particularly Selkirk. This last, as already mentioned, was the most heavily involved in the production of uniform cloths and this wartime boost for the textile industry is reflected in the sex ratios as well as in the age structure of the county. The 1951 figures reveal that the second world war had a far smaller impact on the sex ratios in Scotland and that the effect of female employment in the textile industry is much less. Only Selkirk records high sex ratios in the 15 to 25 age-group. Ratios in Roxburgh appear to have been affected by the factors of the greater agricultural employment, as in Berwick, and the greater diversity of industry within the county, the latter involving not only the several ancillary agricultural services but also the atypical case of Jedburgh. This town had the benefit of immigration for the North British Rayon Company in the 1930s, giving it a much healthier population structure than the Border norm. It was the consequent availability of housing

and the remains of the pool of male labour after the closure of this firm which made possible the establishment of a new engineering industry, thereby stemming the outflow of more males. Roxburgh, in fact, shows an excess of males over females in the 25 to 30 age range. The case of Berwick is also of great interest at this time as it is representative of a rural agricultural area where there are no sizeable towns and very little industrial development. Thus the rural to urban female migration, discussed at greater length in connection with regional variations of the sex ratios, is not a movement within the county as in Peebles, Roxburgh and Selkirk but one which takes females largely outwith the administrative boundary. The consequence of this on the sex ratio is readily apparent. At no age to 45 does the ratio rise above 104, and six of these nine cohorts, in fact, record an excess of males. The ratios displayed in Table III.9 give rise to a healthier sex balance than at any time in the preceding century. Only Selkirk and Peebles in the 20 to 24 cohort record an abnormally high sex ratio, although this too is on a smaller scale than previously and results from the greater employment opportunities for females in the textile and tourist industries.

But the pattern described by Bogue (1969), and cited earlier, has been disrupted in Scotland by migration and war and additionally in the Border Counties by the nature of the employment structure. Over the age of 45, the sex ratio gradually increases as a result of the lower mortality and greater longevity of females. Unusually high

ratios in specific cohorts can be traced back to earlier male out-migrations or female in-migrations. For example, Selkirk's high 1951 ratios in the 55 to 64 age-group is the outcome of the large female excess in the 25 to 34 age range of 1921. As in other areas and countries generally, the tendency for women to outnumber men in the older age-groups is increasing.

The changing areal patterns of the sex ratios of the Border Counties since 1801 are examined by maps of the ratios at parish level (Figs. 45 to 51). Parishes with very high sex ratios, 120.0 and over, are emphasised by shading in solid black while the shading type changes from lines to dots where there is an excess of males over females.

The first map in the series (Fig. 45) reveals little in the way of a recognizable pattern. The overall fairly high county sex ratios discussed earlier result from an evenly distributed number of parishes with large proportions of females. These parishes tend to group together along the Tweed valley but this in itself is not necessarily significant as four of the six parishes with excess males are also found here in contiguous positions. When those parishes with ratios of 115.0 to 119.9 are also considered, the arrangement appears even more haphazard. However, by 1831 (Fig. 46) a pattern is beginning to emerge with an excess of men in the western and higher areas and female predominance in the lower eastern half of the Tweed

Basin. The higher parts were probably undergoing agricultural improvement at this time requiring chiefly male labour. In the east, however, much improvement had already been undertaken, and a parallel may be drawn with the patterns in New Zealand described by Franklin (1956) where sex ratios were found to increase with intensity of agriculture. Certainly this theory has much to commend it for the Merse lands tended to be farmed on an estate system which provided considerable employment for women in personal service. The commentary given with several of the parishes in the Census provides valuable additional information. In some parts of the Borders, new roads were under construction at this time, giving rise to the presence of excess males. For example, 183 men were recorded as being employed on the line of a new road in the parish of West Linton in 1831. Assuming that this number of males normally resided outwith the parish, which is the implication given by the Census, by subtracting them from the parish total the sex ratio changes from 81.9 to 103.9, a significant difference. Unfortunately, this annotation in the 1831 Census of Scotland appears to have been left to the discretion of the schoolmasters who were then in charge of the parish enumeration, and such detail of information is available for but a few of the parishes. Men engaged upon road building are also mentioned specifically in Ashkirk, Ettrick, Lauder and Channelkirk, while harbour construction is recorded at Coveshore in Cockburnspath. Perhaps the most interesting comment is made with regard to Jedburgh

where it is said that "female labour in agriculture is very prevalent in this parish". It would appear that the extent of this practice was soon to be reduced, for Jedburgh, unlike other "urbanised" parishes, does not display high female domination in later years.

The general pattern appears to alter little by 1861 (Fig. 47) with the Merse retaining the higher ratios, a reflection of the county trends examined earlier. With the exception of Earlston, the highest ratios occur in small agricultural parishes where the population is living in a dispersed settlement pattern (see Figures 6 and 15). However, the incipient textile industry of the Galashiels-Innerleithen area is already affecting the ratio between the sexes and this may be regarded as the first stage in a process which continues through 1891 (Fig. 48) to 1921 (Fig. 49). Indeed, the Border Counties present in microcosmic form the trends described for the whole of England by Saville (1957, pp. 95 to 97). Thus, as in the rural counties of England, Berwick in general and the lower rural parishes elsewhere "still showed the normal excess of females characteristic of the population as a whole but, as the end of the nineteenth century approached, employment opportunities for women in the rural areas were diminishing fast with the decline in small-scale and rural industry but the demand for personal services of all kinds maintained a female surplus in most rural areas down to the outbreak of the First World War." He goes on to examine the forces attracting female labour in the nineteenth century and which resulted in high female surpluses

in three different types of areas. The first, the residential counties surrounding London, is a special case and cannot be expected to occur elsewhere on the same scale. However, it is significant to find that the parish of West Linton, which by the turn of the century was beginning to function as a fashionable residential outlier of Edinburgh, displays similar characteristics. Here the sex ratio increases from 107.2 in 1891 through 112.2 (1901) and 118.3 (1911) to 128.7 in 1921.

The second and third types described by Saville are also paralleled in the Border Counties. There are rural areas containing fashionable watering-places within their boundaries and industrial areas requiring a high proportion of female labour. The former is not found as a separate entity in the Border Counties as it is in South West England. However, a combination of the two types, for which Saville offers Gloucestershire and Bedfordshire as examples, can be seen to correspond with the parishes of Peebles and Innerleithen where, by 1921, ratios of 133.2 and 130.9 are recorded. The parishes which contain textile industries within their boundaries all show a sharp upswing in proportions of females during the sixty years since 1861 and stand out as areas of extreme imbalance in Figure 49. Here it can be seen that not only these parishes but certain of the contiguous parishes are affected. Such is the case in Traquair where many of the workers in the Innerleithen and Walkerburn mills are housed, and in Bowden with its ready accessibility not

only to Selkirk town and Galashiels but also to Melrose and St. Boswells.

It should be recognised, however, that this female migration to the textile towns is only a striking instance of a more general movement of females from rural to urban areas. An examination of the 1891 pattern reveals that, of the twelve burghal parishes, ten have sex ratios of over 115.0 while the two exceptions, Jedburgh and Lauder, move into this category by 1921. In addition, there are other interesting features revealed by these maps. The first may be seen in the upland rural parishes where, in 1861, males outnumber females or else there is only a small excess of females. In spite of anomalies such as Castleton and Cavers where railway construction temporarily, but substantially, increased the numbers of men, the trend cannot be considered as other than general. The cause is to be found in the attraction to the towns of women from the more isolated rural areas. It is a pattern which is repeated and extended to the lower rural areas a century later. In the intervening period the sex ratios rise in most parishes, probably as a result of male external emigration initially and later through military commitments. Secondly, Figure 49 shows that for the first time no parish in Berwick has a sex ratio over 120.0 and that those with the highest ratios contain burghs or large villages such as Eyemouth, Duns, Lauder, Earlston and Eccles. This provides a further illustration of the movement of females from the rural areas to the towns.

Figures 50 and 51 depict two stages in a complementary pattern of falling sex ratios in all but the "urbanised" parishes. In 1951 the Peebles-Galashiels-Hawick axis stands out as the main zone of female dominance. Elsewhere the ratios tend to approach parity or fall below it. This trend is continued and extended in 1961 at which time thirty-eight of the eighty-three parishes in the Border Counties show a male surplus and all but twenty-two parishes record a sex ratio lower than the national average of 108.6. The main causal factor would appear to lie in the changing pattern of net migration. The decreasing tendency for textile workers to commute daily from areas outside the Border Counties, as for example from Dalkeith, has resulted in a smaller inflow of females to the textile areas while the propensity of women to migrate outwith the Border Counties has increased, especially in Berwick.

Finally, mention must be made of certain anomalies that have occurred in the Border Counties. Some of these have been discussed already, such as Jedburgh, whose sex ratio has been consistently lower than might be expected of a town associated with textiles. The case of West Linton has also been considered with its high female surplus of 1921. Since that date, its sex ratio has fallen. This drop may be ascribed not only to the overall trend of decrease associated with the higher birth-rate but also to the residential camp, present within the parish during the past two Censuses, increasing the proportion of children still further. In 1961 both Eddleston and Caddonfoot show rising ratios, the latter being 129.2, the highest in

the Border Counties; the cause may be found by drawing a parallel with the 1921 situation in West Linton since both parishes lie within easy commuter reach of Edinburgh. In Caddonfoot, however, there is the added factor of Peel Hospital, the majority of whose staff and geriatric patients are likely to be female. For Eddleston, on the other hand, there is no such factor known and the ratio is the more remarkable because of the consistent male excess to this date.

It may be noted that several extreme values have appeared on the maps upon which no comment has been passed. Generally, such extremes are caused by the small size of the parish population; thus a small change in absolute numbers may result in a sharp swing in the sex ratio. Parishes displaying this characteristic include Bedrule, Cranshaws, Hownam, Makerstoun, and Stobo, but perhaps the best example is found in Lyne where, with a maximum population of 167 (1801) and a minimum of 57 (1961), the sex ratio varies erratically thus: 149.3 (1801), 88.0 (1831), 86.1 (1861), 115.9 (1891), 123.5 (1921), 72.7 (1951), 83.9 (1961).

Nevertheless five parishes remain as anomalies for which no adequate explanation has yet been found. In the case of Nenthorn in 1891, the extremely low ratio of 57.1, as compared with an average for the parish of about 110 in other years, doubtless results from a large-scale immigrant labour force temporarily engaged on some local project. Broughton, Glenholm and Kilbucho in 1921, on the other

hand, revealed an unexpectedly high ratio of 115.5 which might stem from disproportionately large male war casualties or post-war emigration in the parish with the female element temporarily inflated by female holiday-makers because of the June census enumeration. Such exceptions are temporary, however, and can hardly be considered significant. Of more importance are three parishes where extreme values are a more permanent feature. Stichill, a small Merse parish in Roxburgh, whose population has declined from 921 in 1801 to 213 in 1961, recorded sex ratios of over 118 until 1921. Although female excess was common in rural areas during this period, no logical explanation has been found to account for these extreme values. Mordington, on the other hand, has displayed unusually low ratios throughout its history with a male surplus since 1861. It is suggested that its location between the Eyemouth-Ayton nucleation to the north and Berwick-upon-Tweed to the south may have presented two sources of attraction for the females of the parish. Finally, Yetholm has invariably shown a higher sex ratio than its neighbouring parishes, and whilst in the nineteenth century this may have resulted from the employment attraction offered to the female element by the twin villages of Yetholm and Kirk Yetholm, this cannot be wholly responsible for the 121-plus ratios of the present century. It may be recalled that Yetholm parish also presented something of an enigma in Chapter II.

In conclusion, it is suggested that this analysis of the sex ratios has provided considerable insight into the present social and

economic problems faced by the Border Counties today. It has revealed that the conclusions drawn in the research of Franklin (1956), Saville (1957) and Clarke (1960 and 1965a) on national scales are equally applicable in smaller areas and that the three-fold method of approach adopted in this study is complementary rather than repetitive, yielding a greater understanding of the cause and effect mechanisms operating within the demographic structure of the community.

2. The Occupational Composition

If the population's sex ratios have received scant attention from geographers, its occupational composition has been neglected even more. Although the census volumes have provided a great deal of valuable information on the distribution and nature of economic activity in Britain since 1801, an examination of the occupational returns reveals some of the reasons for this neglect. They form, as Wilkinson (1952) points out, quoting the General Report of 1881 for England and Wales, "the most laborious, the most costly and, after all, perhaps the least satisfactory part of the Census", while the Registrar-General for Scotland in 1861 discussed at length "the vicious practices and the evils" of the occupation enumeration.

The major difficulty inherent in handling the census data on occupations stems from the ever-changing basis of classification

devised by succeeding Registrars-General. A brief history of attempts at classification in the Census is outlined by Wilkinson (1952) and need not be repeated here. Suffice it to say that, although Dickinson (1963, p. 148) states that "occupational statistics relate to the kind of work a person does, irrespective of the industry which employs him", this has not always been the case and great care must be taken to establish upon what basis the classification has been drawn up. Therefore a statement of the system in operation at each point in the time-series is included in the ensuing analysis. More recently, the United Nations Statistical Commission has devised the International Standard Classification of Occupations (I.S.C.O.) which is sufficiently restricted in its number of divisions to be of great value for international comparisons and trends. However, this may be regarded as adding another dimension to the problem, since not one of the various classifications used in Britain corresponds exactly to the ten-group system of the I.S.C.O.

In the context of the Border Counties, the problem of classification takes on another aspect. With up to thirty-two Orders in the Occupation Tables in this century, the necessity of condensing this number of divisions becomes apparent. With the advantage of hindsight, a classification system was drawn up which adhered as closely as possible to that used by the United Nations Statistical Commission. A similar attempt at re-classification on the I.S.C.O. basis was undertaken by Farrag (1964). He regrouped the Census data for England and Wales from 1841 to 1951 and, although he does not

give a full account of the adjustments he made, the problems he encountered appear to have been the same as those found in the current study. He states, "It was inevitable to exercise an element of subjective judgment in order to ensure that the re-classification of earlier data in I.S.C.O. groups produced acceptable results. In cases where the exercise of such judgment would have involved large alterations of existing data, it was thought preferable not to embark on any major adjustment which might give the data an air of spurious accuracy. In such cases we indicated that the series were comparable only for earlier years. Thus a break in the series is shown where applicable in each of the tables." It is significant that these breaks come between 1861 and 1891 and between 1891 and 1921. Farrag thus reiterates the doubts expressed later in this section, on the viability of such a procedure prior to 1921. The exact nature of the re-classification system used in this chapter is elaborated in Appendix A. One major deviation from the I.S.C.O. is the separation of textile manufacture from manufacturing in general because of its importance in the economy of the area. In view of the very small numbers involved within the Border Counties, Class 6 of the I.S.C.O. — workers in mine, quarry and related occupations — has been combined with Class 10 — workers not classifiable by occupation — as has the eleventh group recognised in the United Nations Demographic Yearbooks of the 1960s for members of the armed forces. Class 2 — managerial, executive and administrative workers — is largely

undifferentiated in the Censuses of Scotland and therefore does not exist as such, but those persons thus occupied are classified within the industry which employs them. One further class has been added, that of unoccupied for aged 12 and over in 1921 and for aged 15 and over in 1951 and 1961. This class does not appear in the occupational composition diagrams, however, as it was thought that, in view of its large size, it would reduce the impact and clarity of the other divisions. However, an examination of its size, composition and significance is included in the text.

A second problem common to all analyses of occupation data is the distinction between place of work and place of enumeration. Since nearly all census returns of occupations are based on place of enumeration and not place of work, a certain divergence between the two must always be considered when the census data are being mapped. This divergence has been much greater since 1911 because of the increased efficiency of transport systems in moving workers between place of residence and place of work. Wilkinson (1952) comments that "geographers and planners do not seem always to be aware of the inadequacy of census data in this respect". However, the distinction is of greater significance if the data is being used to show the location of industry than if it is being used to reveal the occupations of the inhabitants. Nevertheless, it could give rise to erroneous inference in the present context, as for example in the parish of Melrose in Roxburgh whose boundary is partially contiguous

with the burgh boundary of Galashiels in Selkirk. Thus Galashiels mill workers may live in Roxburgh but within walking distance of their place of work in Selkirk. In fact, it was estimated that, in 1961, 80 persons lived in Melrose parish but worked in Galashiels. In 1951 and 1961, place of work returns go some way toward alleviating the situation but detailed returns are still lacking.

The third difficulty arises in attempting any comparison between one set of census returns and another. The variety of classifications over the years vitiates any attempt at comparative analysis. Indeed it would seem that the one standard and recurrent feature of the occupations enumeration is a statement by successive Registrars-General that the alterations in the classification system preclude comparison between censuses. It must be emphasized that the occupational composition of the population as shown in Figures 52 to 55 should be used only as indicative of the general situation at the given time-period since its validity is governed by the limits of the basic data available for that period. In particular, it should be noted that although the system of classification appears to be the same for 1921, 1951 and 1961, the basis of enumeration — that is, the original classification carried out by the Registrar-General — has varied considerably at each of the three dates and any inference of a comparative nature is difficult and dangerous.

The question then arises — Can any valid comparisons be made? The first comparison that can obviously be made is on an inter-county

basis where the relative percentages employed at each point in time may be analysed in conjunction with differentials in other demographic variables. However, can any intercensal comparisons be achieved? Very little work has been undertaken in this field with the exception of Ambrose (1967). Introducing his analysis, this author states: "Geographers have shown an interest in employment structures ... but almost invariably have considered only one point in time; the dynamic aspect of the problem has been disregarded." He then suggests some techniques for measuring the changes in the employment structure of Canada between 1951 and 1961. While his techniques are useful in this context, it is surely significant that he, a British geographer, should turn to a country outside Britain to exemplify his measurements. Although Ambrose made allowances for changes in boundaries and in group classification, it is suggested that such allowances could not have been made in the British situation where classification changes have been so much more radical. Thus, through lack of comparative basic data, it would be statistically invalid to attempt a quantitative intercensal comparison. This leaves a subjective comparison as the only feasible approach. This method can be significant provided that the comparison is couched in general rather than quantitative terms, and that comparison is confined to occupational changes of a relative nature; i.e., comparison of inter-county differentials. The main value of such an analysis lies in the amount of light it sheds on the study as a whole

and should be judged accordingly.

The only decision that remained was with regard to the form of graphical representation of the occupational composition. The divided rectangle was selected in preference to the divided circle for several reasons, most of which are elaborated by Dickinson (1963, p. 33). The most obvious advantages are that inter-county comparisons can be made more readily and that the total number of economically active persons can be easily read directly from the diagram. As far as possible, the nomenclature used in the Censuses has been retained in the diagrams for the nineteenth century, while that based on the I.S.C.O. is used in those for this century. Economy of space is the only reason for the placing of two diagrams on any one page and any implication of direct comparison is not intended.

Since the Population Act of 1800 required the 1801 enumeration to include a breakdown of the population into three classes of occupations, this Census has been included in the analysis for the sake of completeness rather than because of any inherent virtue, the view taken being that a little information is better than none at all. The statistics themselves are of dubious reliability provided that its limitations are recognised, and this was apparently recognised at the time for, in the Preface to the 1831 Enumeration, there is to be found the comment: "Insinuations were not wanting against the accuracy of the Enumeration (of 1801)." The remarks about the occupation tables were even more damning: "The question of 1801

relating to the Occupation of Persons was found in practice to produce no valuable result. In some cases, a Householder seemed to understand that the females of his family, his children, and servants ought to be classed with himself; in some cases, he returned them in the negative class, as being neither agricultural nor commercial; in some cases, he omitted them entirely. Thus the failure of the question became manifest and the worthless answers were entered without attempt at correction" (Enumeration Abstract 1831, Vol. 1, Preface pp. viii-ix). In addition, it has proved impossible to refine the figures for 1801 in any way owing to the paucity of enumeration data for other demographic characteristics. Furthermore, unlike later Censuses, no commentary is included from the schoolmasters who were, of course, the enumeration officers of the period. The diagram (Fig. 52) shows Peebles to have the highest percentage employed in agriculture in 1801, corresponding with the lowest sex ratio and the smallest proportion employed in Trade, Manufacturing, or Handicrafts. It might be concluded, therefore, that the agricultural improvements which had already been undertaken in the lower parts of the Tweed Basin were currently in progress in the upper reaches, necessitating an increase in the agricultural labour force. It has been noted previously that marginal land was being taken into cultivation at this time to provision the Napoleonic War. However, such a comment is conjectural and it seems just as likely that labourers engaged on the making of new roads were enumerated with agricultural workers or that female and child labour was included in

the enumeration of this county but not in others, there being no evidence to the contrary. Nevertheless, there is little significant difference among the proportions of employment within the four counties and it appears that the area was more economically homogeneous in 1801 than at any later period.

In 1831, the breakdown of occupations was into eleven categories, although for the purposes of the current study several of these have been amalgamated (see below). In addition to the greater detail available, the figures are probably more reliable in view of the much more explicit instructions for the taking of the enumeration given to the schoolmasters, even to the extent of suggesting the use of a simple "prepared formula by means of which the account will be readily taken" (Enumeration Abstract, 1831, Vol. 1, Preface p. vii). Cross-checking of numbers is also recommended and fairly comprehensive lists of "Denominations of Trade" were supplied with each enumeration schedule. It is perhaps surprising to read later in the Preface to the 1831 Enumeration that the great preoccupation of the Census to establish some account of the occupations of the population had no great purpose: "In what degree this minute analysis of Social life may be useful in Statistical investigation, experience only can decide, this being the first example on a large scale, and the division of labour being more complicated in Great Britain than elsewhere, in proportion to the capital accumulated and employed" (Enumeration Abstract, 1831, Vol. 1, Preface p. xi). With one

exception, the occupational figures for 1831 relate only to males aged 20 years and over, which accounts for the relatively small proportion of the population classified as economically active. The exception is found in the domestic group where both male servants under 20 years of age and female servants of all ages are also listed. In Figure 52 no such distinction has been shown, and all servants are grouped within the same category. Similarly, the three classes of those employed in agriculture — namely, occupiers employing labourers, occupiers not employing labourers, and labourers employed in agriculture — have been combined under the heading agricultural. One further amendment has been made in the classes distinguished in the Census in order to take account of the emerging textile industry. It was found that in each of the four counties, commentaries had been added with regard to employment in textiles. Although these tend to be imprecise — in Roxburgh, there were said to be "more than 1,000 weavers and stocking makers", while in the other three counties the adjective "about" is used — it is suggested that the resultant percentage is as reliable as the others for this period. When the number thus occupied had been subtracted from the total employed in manufacturing or making manufacturing machinery, the remainder amounted to less than 1%. Therefore this remainder was added to the figure for "Other Males 20 years of age". The full title given in the Census to the class named "Professional" at this date is "Capitalists, Bankers, Professional and Other Educated Men". Finally, it

was found impossible to compute a figure for economically inactive in 1831 since no indication is given as to how many "Other Males 20 years of age" were unemployed or how many males under 20 and/or females were employed in a capacity other than as a servant.

From Figure 52 it can be seen that agriculture was already more important in the economy of Berwick than in the other counties while textiles had made comparatively little impact. Furthermore, there appears to be a distinction in the type of textile manufactured. The 380 textile workers in Berwick were wholly concerned with processing and weaving linen, those in Roxburgh and Peebles were chiefly involved in woollen and cotton goods with only a few linen workers for domestic use, while the note on Selkirk does not specify the type of weaving. From these commentaries it can also be seen that the weaving had already become partially centralised at a few points. In Berwick, the only concentration was at Coldingham in what appears to have been some sort of "branch factory" where 64 men "are distinctly said to be employed by Master Manufacturers of Edinburgh and Glasgow". In Peebles, Innerleithen and Peebles town were shown as the main centres for woollens while at Linton, 47 men were returned as cotton weavers. The Roxburgh returns record carpet, woollen and cotton manufacture based mainly in Hawick but also in Jedburgh, Melrose and Wilton while most of Selkirk's weavers were located at Galashiels with "a few at Selkirk". At this date, textiles accounted for only a small proportion of the employment in Peebles, while Roxburgh and

Selkirk had forged ahead with Roxburgh already recording more than twice Berwick's percentage in this class.

The coincidence of a large percentage of non-agricultural labourers in Peebles with a very low sex ratio suggests that males had been brought into the county for road and other construction work. This conclusion is supported by evidence from the Census where details are given of 183 men thus employed in the parish of West Linton and the comment is made under the parish of Peebles that most non-agricultural labourers were working on public roads. Thus about 280 of the 460 in this category are specifically stated to be employed in road-making. Roxburgh was first in the Retail Trade and Handicraft section and a study of the detailed figures reveals that many of these were in trades associated with agriculture such as agricultural machine maker, blacksmith, carter, cattle dealer, corn dealer, miller, saddler and skinner. Roxburgh also led in the percentage engaged in textiles at this time but had by far the smallest proportions of non-agricultural labourers and of servants. Peebles, on the other hand, had the highest percentage of servants, which may be indicative of the emergence of spas in the county, the population increase at Innerleithen being attributed in the Census footnote to the mineral well situated there. The New Statistical Account records that "the number of lodgers in the village of Innerleithen for the benefit of the waters in the course of the summer 1832 was no less than 1438" (New Statistical Account of Scotland, 1845, Vol. III,

Peebles, p. 31) (the 1831 enumeration was carried out on the last Monday of May). It is surprising to note a marked disparity in the percentage figures in the Professional class with 1% fewer in Peebles than in any of the other three counties. The reason for this is not clear, although it may be attributed to the absence of any sizeable town or burgh in the county. Kelso parish, for instance, had almost three times as many Professional men as Peebles parish but less than twice as many males aged 20 and over.

The 1861 Census of Scotland, being the first publication under the auspices of the Registrar-General, is held by many to give the first reliable population statistics for the country. However, great care must still be shown in handling the figures for a number of reasons. It is important to note, first of all, that the figures for occupations, as in the case of age, refer to registration districts and not civil districts. For the most part, there is little difference in the population totals, although in Roxburgh it amounts to over 400 persons or almost 1% of the total. However, even this number is unlikely to impinge greatly on the overall picture. Unlike the Commissioners for the 1831 Enumeration, the Registrar-General in his report in Volume II of the Census of Scotland, 1861, clearly states the purposes for which occupational enumeration should be taken. He then proceeds to decry their value as recorded in their current form, citing several examples of the evils of the system. Nevertheless, the enumeration is by far the most comprehensive up to that

time, consisting of six classes subdivided into 18 Orders, 88 sub-Orders and 431 occupational divisions. In Figure 53 the system of classification into the six basic classes was used with two major refinements. The first was to subtract from the Domestic class the whole of Order 4, namely wives, widows, children and scholars, removing them entirely from the total of economically active and renaming them economically inactive. The proportions of these to the total population were as follows: Berwick 53.8%, Peebles 52.4%, Roxburgh 52.2%, Selkirk 54.6%. The second refinement was to extract Order 11, textiles and dress, from the Industrial Class and establish it as a separate class. These represent the first accurate figures for textiles used in this series and, as such, cannot be compared directly with those for 1831. Nevertheless, the greatly increased proportion associated with textiles gives an indication of the growing importance of this part of the economy and certainly of its relative importance to each county.

It would appear that 1861 is the period which first established the trend of the present-day economic pattern. Berwick, at its population maximum, has over half its economically active involved in agriculture. Obviously, at a time when most of Britain was undergoing industrialisation, Berwick's economic growth depended on the demand for farm products. Thus 1861 marks a turning-point in the history of the county for, in the wake of the Industrial Revolution, came rural depopulation and, with little industrial development in the county, Berwick lost population to those areas where manufacturing

was established. Only one quarter of Berwick's labour force was engaged in industrial occupations and just over one third of those in textile and dress.

At the other end of the spectrum, Selkirk portrays the reverse situation with just over half the population employed in industry, almost three quarters of whom were involved in textiles while only 25% of the total population were engaged in agricultural pursuits. By this time Galashiels had a well-established textile industry, and it becomes apparent that, while Berwick remained largely dependent on agriculture, Selkirk's economy was becoming increasing reliant upon textiles. Indeed, the 1860s began a "boom" period for Selkirk's woollen manufacture which was to continue almost to the end of the century, bringing in its train an expanding population, a steadily rising sex ratio and an increasingly youthful age structure. This last feature is reflected in the high percentage of economically inactive persons at this time.

Roxburgh and Peebles appear to follow the trend set in 1831. In the case of Peebles, the population was still heavily involved with the land, with almost 44% of her workforce thus employed. The textile industry had expanded at a much slower rate than in Selkirk, while the percentage in domestic service was the highest in the Border Counties. Roxburgh appears to have the most balanced economy with greatest diversity in its employment structure. Under one third of Roxburgh's labour was employed in agriculture in 1861, the

proportions in the industrial sector were evenly divided between textiles and other types of manufacturing, while it had the lowest percentage economically inactive of the four counties. It is interesting to note that the percentage of Professional persons, though at no time varying very significantly, was exactly the same, 3.1%, in all four counties in 1861, and this may also be said of the Commercial category, with the exception of Roxburgh which was 0.2% higher.

In 1891 the Registrar-General divided the occupations of the population into 6 Classes, 26 Orders and 82 Sub-Orders which embraced 367 occupations or groups of occupations. For the purposes of drawing the diagram in Figure 53, two alterations were made to the basic classification. As with the 1861 figures, those engaged in the manufacture of textiles and dress were subtracted from Census Class III and recorded separately. Census Class VI, however, was withdrawn entirely from the number enumerated as economically active and regarded as the proportion of the population which is economically inactive. Unlike 1861, this total comprises not only children and scholars but also "Persons retired from business but exclusive of those retired from the various Professions; Pensioners; those living on their own private means; and others above 15 years of age" (who are unoccupied or non-productive). The last category is composed largely of females between the ages of 25 and 65 and who are presumably housewives. Such persons form the following proportions of the total number of inhabitants of each county: Berwick 55.6%,

Peebles 55.6%, Roxburgh 54.9%, Selkirk 53.2%. The apparent increase in the non-productive sector of the population over 1861 is most likely caused by this change in the system of classification.

The trends shown in the occupational composition of 1861 continue and are apparently strengthened by 1891. It is most unlikely, in view of the large differences involved, that the decrease in percentages engaged in agricultural pursuits and the rapid expansion in the textile industry can be explained entirely by the changes made in the classification system in the intervening period.

In agriculture, Berwick had almost twice the percentage of any of the other three counties and five times that of Selkirk. With 47% thus employed, the county was still very much dependent on the land. An examination of the absolute numbers involved reveals that the declining population since 1861 broadly corresponds to the decrease in those engaged in agriculture. Again it may be said that agriculture is to Berwick as textiles are to Selkirk. The important difference between the two economies, based as they are on a single activity, is that it is easier to diversify in industry than in agriculture. In Peebles, the emphasis had changed from predominatly agricultural to industrial, with textiles occupying 36.9% of the economically active as opposed to 23.2% in agriculture, a virtual reverse of the 1861 situation. Roxburgh too shows decreased involvement in agriculture, but on a less spectacular scale.

The most interesting feature of the 1891 diagram (Fig. 53) is

the percentages engaged in the textile industry. This type of occupation entirely dominated Selkirk's economy with 54% of its employed population dependent on textiles in this, the year of its maximum population. It is evident that the Industrial Revolution had a very marked impact on Selkirk in that all but 28% of its economically active population were enumerated as engaged in industry (Classes II and III). Significantly, the proportions in each of the five other categories were smaller than in the other Border Counties, and textiles had overtaken other types of industry in both Roxburgh and Peebles. In all three counties, the sex ratio had increased substantially, while the increase was much smaller in Berwick where there was no growth in textiles at the expense of other industries but rather the reverse. In all counties, numbers employed in textiles were more or less equally divided between male and female, whereas other industries were chiefly male employers. However, in Berwick the proportion of females employed in other industries was twice as large as elsewhere in the Border Counties.

While doubts may be cast on the enumeration and classification system once again, it may be significant that a certain correspondence exists at this time between the proportion in domestic service and the percentage in agriculture. The percentages in both were highest in Berwick, second highest in Roxburgh and extremely low in Selkirk. Roxburgh remained the county with the most evenly balanced economy of the four, a function perhaps of its size and landscape variety.

Occupational statistics were subjected to much greater refinement by 1921 with the Census of Scotland developing a two-fold classification system about this time. Indeed, the introduction of classification by occupation and by industry was launched in the Census of 1911, but the modifications were apparently so radical that the Registrar-General for Scotland states that "the introduction (in 1921) of completely new lists almost entirely prevents any satisfactory comparison being made between the numbers now ascertained and those ascertained by previous censuses" (Census of Scotland 1921, Vol. III, p. v). However, there exists for the first time a statement as to the manner in which the classification is carried out, while one could only hazard a guess previously. The distinction between the two sections of the classification lies in the fact that the occupational statistics relate to the kind of work a person does, irrespective of the industry which employs him, while in the Industry Tables a worker is classified by the industry which employs him, irrespective of what job he does. Thus, the total for a particular industry in the Industry Tables will usually be larger than that for the most comparable heading in the Occupation Tables.

The possibility of choice between the two now presented itself, although, upon examination, the solution seemed obvious. As has been seen in Chapter II, there is a tendency for the population geographer to stray from the central core of his analysis, and become side-tracked into studying location rather than the individual himself.

"Occupation is a personal characteristic and the tables have therefore always been arranged to show what occupations the people of X follow, no matter where these take place. The Industry Tables have a place type of arrangement showing totals for the numbers employed in the industries of X no matter where the workers come from" (Dickinson 1963, p. 148). Thus, apart from the continuity achieved by using tables which are, in general, based on the same principles as in previous Censuses, the fact remains that the study is one of people who have already been located at these approximate dates in Chapter II.

The Occupation Tables of 1921 were arranged in some 32 Orders, sub-divided into 600 Sub-Orders. With such a large number of Orders, obviously it was neither practical nor desirable, in view of the small numbers involved in certain of the Orders, to portray all of these diagrammatically. The method of condensation is explained in Appendix A.

The percentages of economically inactive in 1921 are over 10% lower than in 1891 in each of the four Border Counties and were recorded as follows: Berwick 14.2%, Peebles 39.5%, Roxburgh 38.6%, Selkirk 36.3%. This reduction is probably the result of the following factors. In the first place, the enumeration now specifically excludes all children under 12 years of age. Secondly, it was becoming increasingly acceptable and prevalent for women to work, especially in the industrial urbanised areas. The Census returns provide evidence of this in the percentages of females aged 12 and

over who are economically inactive. In Berwick, 70.5% were recorded as unoccupied whereas only 58.6% of Selkirk's females were thus enumerated. In the textile industry itself, a larger proportion of employees were female although this is not necessarily significant in view of the enlarged number of categories. The extraction of transport workers, mainly male, cannot be regarded as entirely offset by the extraction of clerical workers where males and females are found in almost equal numbers. Nor can verification be deduced from the Industrial Tables in view of the rider that the labour is drawn from an unspecified area. This is particularly applicable to Selkirk where the labour field probably extended then, as now, into Roxburgh and Midlothian. Thus a fully quantitative assessment of the position cannot be made. However, this increase in female labour is not confined to the industrial environment. In the professional field in all four counties, women had achieved parity in 1921 — in numbers at least — while in 1891 there were twice as many professional men as women (it is suggested that the making of this comparison is justified in that, of all categories, the Professional one has been least modified by dassification changes). A final factor must be the high proportion of adults in the population of each county, rising from 65.7% in Berwick to 69.1% in Selkirk (see Table III.2).

The decrease in numbers employed in agriculture is a feature common to all four counties but the 1891 rankings are maintained and emphasised by a further marked decline in the Peebles percentage.

In the textile industry, a similar decrease occurred, although the proportional ranking among the counties altered little. The percentages employed in other industries show a different trend with the largest decrease in Peebles and the smallest in Berwick. This is probably offset by those enumerated in the unclassifiable category which, if combined, yield percentages remarkably similar to those for other industry in 1891. As already suggested, the decreases in agriculture and in industry of all kinds may be more apparent than real as a result of the radical changes in classification.

Of the other categories, it is interesting to find an increasing disparity in the Professional groups where Peebles had 4.2% and Selkirk only 2.8%. Commercial workers were most numerous in Selkirk in conjunction with the highest percentage in the industrial field, while the proportions in transport would seem to correspond with the areal extent of the county. The lead in personal service was retaken by Peebles, perhaps indicative of the emergence of the county as a retirement and tourist area, followed closely by Roxburgh and Berwick, a relic possibly of the estate-type organisation of farming and land ownership, while Selkirk's economically active females have sought other types of employment.

In 1951, over 17,000 different occupations were recognised, but these have been consolidated by the Registrar-General into 26 Orders and 61 Sub-Orders. For the current analysis, these 26 Orders have been reduced to 10 on the basis outlined in Appendix A.

As previously the tenth category has not been included in Figure 54, and in 1951 the percentages of economically inactive were: Berwick 45.1%, Peebles 43.6%, Roxburgh 40.9%, and Selkirk 37.9%. These increases in persons economically inactive over those in 1921 are even greater than might at first appear, in that the percentages exclude those aged 12, 13 and 14 years. This rise is a result, not of a higher unemployment rate nor of a decrease in the number of females employed, but of the much higher proportions of aged (see Table III.3).

The decrease of persons employed in agriculture continued over the period 1921 to 1951 but at a much reduced rate and over 40% of Berwick's labour force was engaged in this activity. However, a rapid decline is to be seen in the textile industry in all four counties but most markedly in Selkirk, where the percentage employed has fallen from 42.2% in 1921 to 28.6% in 1951. Even allowing for classification changes, this represents a significant decrease. This has been compensated to some extent by diversification of industry, and proportions in the Other Industrial Class have increased by at least 3% except in Berwick, which has remained static. This is accompanied by an increase in other and unspecified occupations which in Selkirk amounts to 3%. Proportions in personal service are evenly distributed with the exception of Peebles with its now expanding tourist industry, and figures for those employed in transport and communications appear to be stabilising around 5.5%. The

Proportions of clerical workers still parallel the ranking in textiles, while Peebles still leads in the Professional category although the proportion in Selkirk has expanded remarkably.

It is unfortunate that the 1961 figures, being based on a 10% sample, are not available or meaningful for an area smaller than the Border Counties as a whole, and Figure 55 perhaps illustrates the disadvantages of 10% sample data more than anything else. However, it has been included in the present survey as being the most recent available Census record of occupational composition relevant to the study area, and may serve as indicative of the average situation in the Border Counties at present. Nevertheless, it loses what has been forcefully revealed by the preceding six diagrams, namely the great contrast between Berwick and the other three counties.

Alterations in the classification system have not been as radical between 1951 and 1961 as previously, although the coding has changed considerably (see Appendix A). 27 Orders were distinguished at this time, the only omission since 1951 being that of the economically inactive. This last, however, was readily computed from figures given elsewhere in the Census. The average percentage of economically inactive fell to 39.9% and, since the dependency ratio increased spectacularly throughout the area (Table III.4), this would seem to indicate a higher proportion of the adult age-group were gainfully employed. An examination of the absolute figures reveals that there was an increase of almost 1,000 females in employment over the decennial period. Another possible cause could be an increasing

tendency to continue in employment after normal retirement age but this cannot be verified from the Census.

The general situation as portrayed by Figure 55 is one in which agriculture and textiles remain the twin kingpins in the economy of the Border Counties with 0.8% more employed in textiles. The only other category which records more than 10% of the labour force is that of other and unspecified (15.8%). Other increases are found in the Professional, Clerical and Commercial sectors while that of personal service appears to have reached a point of equilibrium. The decrease in the proportion employed in transport and communications may well be an expression of the contraction of the rail and bus services which is still continuing throughout the area to the present time.

This examination of the average situation in the Border Counties gives a much healthier appearance to the occupational composition and, if taken in conjunction with the unemployment rate, the position seems buoyant enough. The Border Counties record the lowest unemployment rate in the country, an average annual rate, 1959 to 1966, of 0.81% compared with a national average of 3.6%. Accepting the normal full employment figure of 1.5% unemployed, the Borders are suffering from a state of over-full employment. The most common cause of this is too fast a rate of industrial expansion. From the foregoing analysis it is readily apparent that, while this might have been true in 1891, with the contraction of industry and a decreasing labour force in the twentieth century it cannot be tenable now. An alternative cause may

be found in an adverse employment structure inducing a high net emigration from the region. The adverse employment structure has already been revealed in this chapter, a structure which is dominated by agriculture in Berwick and textiles elsewhere.[1] The depopulation of the area has been discussed in general terms in Chapter II. Migration must be the next field of enquiry.

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1. For an examination of the extent of this specialisation with reference to the Central Borders see Scottish Development Department (1968), Vol. II, pp. 12 and 13. Here regional coefficients of specialisation have been computed and the Central Borders found to have a coefficient of 0.89, revealing a higher degree of specialisation than in the other mainly industrial areas chosen for the comparison. It is extremely doubtful whether such a measure is worth the amount of calculation involved since, as the report points out, the individual industries are not weighted by size. Furthermore, since the degree of specialisation varies inversely with the size of the region, wherein lies the value of comparison with an area such as Yorkshire and Humberside which is commonly known to have a multi-industrial structure anyway? Since it has been shown in the preceding analysis that employment in the Central Borders has been concentrated in a single industry, it is suggested that, in this context, the analysis by occupational composition is more significant in that quantitative measurements have been made by means of proportions employed in each industry and in greater detail than would be possible by computing coefficients of specialisation.

CHAPTER IV

POPULATION DYNAMICS

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POPULATION DYNAMICS

One of the most important single demographic facts about a population is its rate of growth.[1] As has been discussed in previous chapters, the rate at which a population is changing affects not only its size and composition but also its capacity to increase in the future. "Population growth is a dynamic equilibrium between forces of increment and forces of decrement" (Bogue 1969, p. 37). Continuously the population is being increased by the birth of infants but it is simultaneously being diminished by the death of persons of all ages. Meanwhile migration presents a similar situation with in-migrants arriving and out-migrants departing. Thus population growth is composed of four major components: fertility, mortality, in-migration and out-migration. The balance between births and deaths is usually known as "natural increase", and although the net resultant is not necessarily an increase, as for example in Selkirk between 1931 and 1950 (Table IV.3), it is intended to adhere to the use of this term. Net migration is the balance between in-migration and out-migration and also may be positive or negative. The aim of

1. The term **growth**, in the demographic sense, is used to denote both positive and negative change and thus may refer to either population increase or, in the case of negative growth, population decline.

this chapter therefore is to analyse population growth in the Border Counties from 1755 to 1961 through its natural increase and its net migration. It is proposed however to place particular emphasis on the migrational component of growth as it is this aspect which has been found the more significant in the changing distribution and characteristics of the Borders population.

It is not within the scope of this thesis to examine in detail the vast literature on population migration. Nevertheless, in order to set the present topic in perspective, it is felt necessary to review briefly some of the conventional ideas and methods used in this research field. Morill (1965, p. 33) states that migration has been studied essentially in three ways: analyses of movements into and out of an area; systematic studies of factors affecting migration; models of migration. The aim of the current analysis as defined above obviously places it in the first category, but, since these three types of approach are not mutually exclusive, ideas derived from studies of the second and third types will be incorporated or tested. Thus it is thought pertinent to review research of all three types.

Systematic studies of population migration have provided detailed surveys of movements and of migrant characteristics and motivations. Most of this research has been conducted in the United States and in Sweden, countries which are fortunate in possessing a wide range of high-quality data. Thus studies of population redistribution based on change of residence statistics such as those by

Bogue *et al.* (1957) in the United States and Wendel (1957) and Hagerstrand (1957), are fairly numerous. In countries where such figures have been collected only within the past ten years, this type of research has been possible only very recently, as for example on Thailand by Ng (1969) and in the case of Scotland by Jones (1967, 1967a, and 1970). Similarly, studies of factors associated with migration are most prolific where sources of detailed data are readily available. This is the case in various analyses of social and economic factors such as amenities, occupation, income and unemployment by Ullman (1959), Price (1941), Nelson (1959) and Oliver (1964), among many others. Studies of single factors have been criticised in United Nations (1953), where — referring to migration — it is stated that "it is difficult to devise statistical techniques for measuring empirically the influence of a given factor upon the rate of population growth". The use of correlation analysis in an effort to quantify the effect of per capita income on areal or temporal variations of rates of population increase is specifically instanced in the same work and evokes the comment, "The results are apt to be misleading inasmuch as the techniques of correlation analysis used, do not take into account the complex of other factors which may also be contributing to produce the various rates of population change." Kariel (1963) goes some way toward obviating this criticism by extending his correlation analysis to include multiple co-variance. Nevertheless his findings show that the more inclusive independent variable

such as socio-economic status or size of employed labour force were better predictive variables than "purer" ones measuring primarily one factor such as median income or change in the number of employees in manufacturing.

Over the past eighty-five years, a large number of migration models, both empirically and theoretically based, have been developed. The earliest of these was a set of "laws" formulated by Ravenstein (1885 and 1889) and discussed and extended by Lee (1966). They were re-tested in the British situation by Jones (1965) and found largely to have withstood the test of time in that instance although elsewhere they have been challenged (for example, Bogue 1969, p. 756). The first of Ravenstein's laws describing the basic relationship of migration and distance was expanded and adapted by Zipf (1946) and Stouffer (1940) but found by Anderson (1955) not to agree especially well with the facts. More sophisticated refinements and extensions have been attempted and many of these models are examined and discussed by Morill (1965), Olssen (1965) and Masser (1970) prior to propounding their own elaboration of the migration model. Perhaps a more promising line of approach is suggested by Thomlinson (1961), the primary objective of whose deterministic rather than predictive model was to enable comparison of migration rates by controlling for seven spatial variables, "somewhat as standardization of vital rates permits us to compare fertility and mortality by allowing for the age-sex structure of the population." In theory, the incorporation of this model would help to refine the analysis of the patterns of migration.

However, as Thomlinson himself admits, the demand on time required by the computations involved extends to months rather than weeks. A balance must therefore be sought between the objectives of this research as a whole and the advantages accruing from the further refinement of technique. As a result, the model proposed by Thomlinson is suggested as a valuable starting-point for further research.

The search for generalisations or laws governing the relation between migration and population growth, migratory selection and migration models is widely regarded as futile. Although everyone will not find himself in complete agreement with Clarke (1965, p. 125) when he states, "The geographer finds himself at home in the study of migrations for there are no laws," migration research appears to reveal that to formulate a universal typology of migration is an impossible task. Bogue (1969, p. 795) comments, "It is fruitless to seek permanent inflexible differentials in migration that will not vary to some degree at least, in pattern and intensity with time and place." In his efforts to suggest generalisations, he puts forward the concept that selectivity of migration should be explained in terms of the combination of push and pull factors present in both the area of origin and the area of destination. Petersen (1969, p 289), on the other hand, contends that it is ridiculous to try to analyse the migration, for example, of gypsies in terms of push and pull. Since, therefore, there would appear to be no universally acceptable set of generalisations to act as a basis for the analysis,

migration in the Border Counties must be examined in the light of such data as are available and, within its limits, the volume, direction, composition and causes of this migration must be analysed. The next stage, therefore, must be a consideration and assessment of the possible sources of data.

(1)
Available Sources of Data

Numbers of births and deaths have been collected and published on a county basis since 1855 in the successive Annual Reports of the Registrar-General. Prior to this date, it is possible to obtain statistics from parish registers. However, in view of the amount of time which would be required to collate figures for all eighty-three parishes of the Border Counties, it was decided not to attempt such an undertaking, especially since the data thus derived are not wholly accurate. For, although certain compensations can be made, it must be remembered that parish registers record baptisms and burials rather than births and deaths. The birth- and death-rates examined in this chapter date, therefore, from 1855.

Migration statistics present a far greater problem. Net migration figures are readily obtained by examining the Annual Reports of the Registrar-General in conjunction with the Censuses of Scotland and are, in effect, the differences between the natural increase and the numerical change recorded over intercensal periods. In Scotland, precise net migration statistics are therefore not available for intercensal periods before 1861 to 1871. Whilst such data are useful

in providing a generalised picture of movement, it gives no indication of the origin or destination of the migrants nor the extent to which the migration may have been a two-way flow.

The direction of migration may be deduced from the birthplace statistics which have been recorded in each census since 1851. Although these data have been analysed in several migration studies, discussed in greater detail later in this chapter, they are unsatisfactory for the purpose on several counts. In the first place, no indication is given of the time at which the individual movements were made. Secondly the migration from place of birth to place of enumeration may have been made in one or several stages. Thirdly, little information is available as to the demographic characteristics of the migrants, although attempts have been made to refine the data (see below, pp. 205-206). Fourthly, return migration to the place of birth, a not uncommon occurrence, is not detected. Nevertheless, birthplace statistics remain the only detailed source of information as to the direction of migration for the nineteenth and early part of the twentieth centuries and, as such, are invaluable.

The Census of Scotland also provides a source of direct migration data but this is available only for 1961 and on a 10% sample basis. The enumeration return included a question asking for the person's usual address, one year previous, if it was different from his or her usual address on census day. The migration tables are presented in such a way as to reveal several characteristics of the

migrant and the distance moved, in addition to the direction of movement. However, several limitations must be noted. Movement prior to 1960 is not recorded and consequently no historical trends can be analysed. Statistics for several of the migration differentials are available for the Border Counties as a whole, and where figures are given at county level they are so small that the 10% sample basis renders them liable to a high degree of error. Furthermore, migration data collected on a 10% sample of households rather than individuals must show inherent bias in that if one member of a household is a migrant, then the probability is extremely high that the other members of the household are also migrants. Finally, there is the objection that no account is taken of any intermediate moves which may have occurred between the dates specified by the enumeration return.

Electoral rolls yield another source of information on migration in that they list the names and addresses of almost everyone over the age of twenty and, since 1969, over the age of seventeen. Thus it is possible by comparing electoral rolls for given points in time to ascertain the numbers of adults who have moved into or out of an electoral division. Again many disadvantages are encountered. As a source of net migration figures, the electoral roll does not provide data as accurate as those estimated annually by the Registrar-General. Obviously, compensation must be made for those under voting age and this group usually includes a sizeable proportion of migrants.

Although the lists of voters are revised annually and yield information on the volume of inward and outward flow, each name on the list must be examined in order to eliminate those who have died, those added to the roll through reaching the lower age limit, and those who have changed their names, by marriage or otherwise, but not their electoral division in the intervening period. Since electoral districts and census enumeration areas are not necessarily coterminous, the information derived from the two sources cannot be used conjointly. Finally, the only characteristic of the migrant recorded by the electoral roll is that of sex, and other characteristics, together with his origin or destination, must be sought by interview.

Between 1955 and 1967 the Ministry of Labour annually published figures for the inter-regional movements of employees in Great Britain based on a 1% sample. These data referred to insured persons of two years' standing, thereby excluding those who had not held an insurance card for two consecutive years, children, retired persons and many married women of working age. However, since there is no breakdown of the statistics for Scotland into smaller units, these figures are of little value in the present context.

The Central Register of the National Health Service at Edinburgh provides statistics of transfers between Scottish Executive Council areas which would give a good measure of migration but for three factors: the data are limited to the Executive Council areas, none of which corresponds to the present study area; there is a

time-lag between movement and registration with a new doctor; and a large but unknown number of moves is omitted because a new doctor is not sought. Further drawbacks are described by Hollingsworth (1969, p. 132): "The young and unmarried are particularly likely to feel no need to register with a new doctor, and it so happens that they are just the group most likely to move. Doctors' lists contain a certain number of 'ghosts' and other duplicates which grows slowly but steadily. After nearly twenty years of the National Health Service, the total inflation of patients amounts to about 5%, caused by duplication and not crossing off some of the dead and those who have emigrated."

National Registration provided detailed information on migration within Britain between 1939 and 1952 since individual movements had to be reported to the local National Registration and Food Office. Such statistics are of only limited value, however, because of the disruption of normal population movements during and immediately after the war.

Foreign migration statistics by the long sea-routes were regularly collected between 1895 and 1963 but, since about 1950, air traffic and migration to and from the Continent have greatly increased and now exceed the long sea-route figures. The series was therefore discontinued in 1963 because it was valueless and there was substituted an International Passenger Survey of approximately 7% of people entering or leaving the country. Information on place of origin or destination in Great Britain is very poor and it is therefore of very

little value in making local estimates of emigration — Hollingsworth (1969, p. 133) estimates, for instance, that only half the Scots in the Survey give their place of origin as "Scotland" while the rest give "Britain". A full discussion of the nature and extent of external migration between 1815 and 1950 is given for Scotland as a whole in Carrier and Jeffery (1953). Significantly, they make no reference to emigration from or immigration to local areas such as the Border Counties.

Finally, there is the possibility of obtaining migration statistics by interview or questionnaire. Theoretically, this might seem the ideal source, since all the desired information regarding the migrants could be obtained. However, such information would relate to only one point in time and to conduct such a survey on a worthwhile scale, single-handed and without considerable financial resources, was found to be impracticable. Further reference is made to information obtained by this technique later in this chapter (see below, pp. 221-224).

This examination of data sources in the light of their advantages and shortcomings reveals that the most comprehensive figures are found in the publications of the Registrar-General. Thus, the most suitable statistics for fulfilling the aim of this chapter with regard to the time-scale are those recording net migration and place of birth, while those providing most detail on the nature of the migration and the migrant himself are contained in the 1961 Census of Scotland,

Internal Migration Tables (Vol. 8).

It is proposed therefore to begin by examining briefly the situation prior to 1860 using information gleaned from a variety of sources. This will be followed by a consideration of net migration vis-à-vis natural increase between 1860 and 1961. The source and direction of migration with regard to the sex differential at various points within this time-period will then be analysed using the birth-place data. This analysis will be amplified for the 1961 period in terms of other migration differentials based on the census migration tables, with a view to obtaining some indication as to the motivation of the migrants.

(2) Population Growth and Movement Prior to 1861

For the period between 1755 and 1860, most information was obtained from five main sources: the annotations in the census enumerations 1801 to 1851, especially those of 1831; the Old Statistical Account (1792-95); the New Statistical Account (1845); McDonald (1937); and Handley (1945). In the first three named, it was found that there was little consistency in the use of the term "emigration". To some writers, it implied movement to a foreign country, while to others it denoted any movement beyond the parish of migrant origin. Fortunately, in most cases reference was made to the destination of the migrant or else this could be inferred from the context, thus avoiding a possible source of ambiguity. However, while

the direction of movements could be ascertained in general terms, an accurate assessment of the numbers involved was obviously impossible since much of the allusion to migration is couched in such vague terms as "Of late there has also been a considerable emigration to America" (N.S.A., Vol. III, p. 48: Yarrow parish) and "Emigration has been very considerable; notwithstanding, the Population has increased" (1831 Census Enumeration, pp. 1026-1027: Jedburgh parish). The volume of total population growth during this period has already been discussed in Chapter II. The migration component of this growth probably played an important part in change in the Border Counties from 1755 onwards, and even earlier. Reference is made in the account of Jedburgh parish (O.S.A., Vol. I, p. 7) to the Union of the Parliaments resulting in depopulation "by enlarging the sphere and facilitating the means of emigration". More specifically in Jedburgh town, the Union appears to have hit the economy hard by ending a thriving contraband trade. "Into England they imported salt, skins and malt which till the Union, paid no duties in Scotland; and from England, they carried back wool, which was exported from the Frith of Forth to France, with great profit. The vestiges of 40 malt-barns and kilns are now seen in the town of Jedburgh while at present there are only three in actual operation; and the corporation of skinners and glovers, formerly the most wealthy in the town, have, since the Union, greatly diminished, both in regard to opulence and number." Other writers also give instances of illicit Border trading (N.S.A.,

Vol. III, p. 342: Mordington parish) and of the ease of movement south of the Border: "Young men join the army and navy or emigrate to London sailing from Berwick and Newcastle where the passage is short and frequent and the freight easy" (O.S.A., Vol. 3, p. 218: Smailholm parish).

It would appear, therefore, that the volume of migration was gaining in momentum by the second half of the eighteenth century and was firmly established as an important component of population growth by the 1790s. The cause is invariably attributed, by writers of that period, to the changing nature of the economy. Reference is most commonly made to the amalgamation or "monopoly" of farms as the underlying cause of parish depopulation. In the O.S.A., twenty-two of the Border County parish ministers mentioned this factor while the N.S.A. contains twenty such comments. It is clear that the enlargement of farms was a widespread phenomenon but the decrease of farm tenants appears to have varied in number from parish to parish. "The number of farms fifty to a hundred years ago was at least four times the present number" (O.S.A., Vol. I, p. 52: Hownam parish); "lands are now let to one sixth part of the former number of tenants" (O.S.A., Vol. 3, p. 218: Smailholm parish); "there are instances in this and neighbouring parishes of individuals renting and farming lands formerly possessed by six, eight, or ten tenants" (O.S.A., Vol. 1, p. 8: Jedburgh parish).

The other agricultural change which led to depopulation during

this period was the conversion of arable land to pasture following the decrease in demand for farm produce at the end of the Napoleonic Wars. The most dramatic instance of this is described in the account of Lilliesleaf parish: "Upon the death of Sir John B. Riddell, Bart. of Riddell, in April 1819, who farmed the greatest part of his estate, the lands were immediately laid out to grass. Such a rapid change compelled those who had been employed in cultivating his extensive domains to seek a livelihood elsewhere and hence the immediate declension of the population in the next succeeding year was 68" (N.S.A., Vol. III, p. 27: Lilliesleaf parish). Elsewhere the blame for population decrease was laid at the door of farmers with an "aversion to rebuild cot-houses" (O.S.A., Vol. 7, p. 504: Yarrow parish), or of absentee landlords (O.S.A., Vol. 1, p. 147: West Linton parish; Vol. 12, p. 375: Traquair parish).

However, in several cases, especially in the N.S.A., agricultural improvements are said to have resulted in population increases rather than depopulation with the introduction of turnip husbandry and its additional labour requirements specifically cited. Nevertheless, it seems likely that these ministers have neglected to take into account a rate of natural increase far in excess of the population growth in the parish although in almost every parish account, comment is passed on the excess of births over deaths and instances are quoted of very large families. For example, in Oxnam parish the average family size in 1793 was seven while one couple there are said

to have produced twenty-two children and two other couples fourteen apiece (O.S.A., Vol. 11, p. 321: Oxnam parish). However, only one writer appears to have recognised the significance of natural increase as a factor in population change, attributing depopulation in his parish to the fact that "twelve of the farmers are batchelors" (O.S.A., Vol. 16, p. 188: Eddleston parish).

The movement from rural areas to villages and towns is frequently mentioned in both Statistical Accounts. In some cases, specific sectors of the population were involved: "a number of widows and single women who live more conveniently in the towns and get employment more readily than in the country" (O.S.A., Vol. 10, p. 587: Kelso parish) and "the constant drain upon the population arising from the necessity under which a large proportion of young men are laid of repairing in search of employment, to places where the market for labour is less limited" (N.S.A., Vol. III, p. 322: Kelso parish). For the most part, employment was sought in the manufacturing areas. To some extent, work was provided by the developing industries within the Border Counties in the woollen mills of Innerleithen (O.S.A., Vol. 19, p. 598: Innerleithen parish), in the brewery and in the woollen and waulk mills at Ednam (O.S.A., Vol. 11, pp. 305-306: Ednam parish), in the paper mills of Ayton and Edrom (O.S.A., Vol. 1, p. 117: Edrom parish) and, later, in Hawick where "the flourishing state of the woollen manufactures, to whose influence, in creating a demand for labour and attracting operatives from other places, the increase in population is mainly to be ascribed" (N.S.A., Vol. III, p. 397:

Hawick parish).

It would appear, however, that many preferred to remain in farming and were forced to seek employment further afield. In the second half of the eighteenth century, the change in land use and development within the Highlands provided new scope for shepherds from the south of Scotland and many of the new Highland sheep-farmers came from Peebles (McDonald 1937, p. 21). However, this migration flow did not last long and by the beginning of the nineteenth century the New World became the focus of emigration. Most of the emigrants were agricultural labourers or small tenant farmers who had been displaced by the new developments in agriculture. "But there were other farmers who went to the New World simply because they wished to make use of their agricultural knowledge in a larger sphere" (McDonald 1937, p. 151). The only parish account which makes specific mention of emigration to America in the Old Statistical Account is that of West Linton: "Some six or eight may have emigrated to America; they write flattering accounts to their friends, but complain of their distance from religious ordinances" (OSSA., Vol. 1, p. 147: West Linton). Despite this lack of spiritual care, dissemination of information about the New World in this way appears to have encouraged further emigration, for references to it become more frequent in the 1820s and 1830s. In the New Statistical Account, such emigration evokes comment in eleven of the parish accounts and where figures can be inferred or are actually quoted — for example:

"During 1830-31, no less than ninety-four persons emigrated to America" (N.S.A., Vol. II, p. 59: Eccles parish) — the proportion of emigrants amounted to between 4% and 5% of the total parish population. The destination was usually rather vaguely described as "America" but some more specific references are to be found: "Several families and individuals have emigrated to British America and the United States at various periods during the last ten years" (N.S.A., Vol. III, p. 27: Lilliesleaf parish). In Berwick, Canada seems to have been the country of attraction: "For these few years past, a considerable emigration of persons belonging to the labouring classes has annually taken place to Canada which, were it to proceed at the same rate for any length of time, would have the effect of sensibly diminishing the population" (N.S.A., Vol. II, p. 370: General Observations). This exodus was largely from the Merse parishes where Canada is stated to be the destination of many families and individuals from the parishes of Whitsome, Ladykirk, Nenthorn and Edrom.

Little is known of the inflow of migrants to the Border Counties between 1755 and 1860, although it seems clear that such a counter-stream did exist, originating mainly in areas which were even more distressed. For example, in 1847, when a severe famine followed the failure of the potato crop in the Highlands, thirty-six women were taken to Berwickshire to do farm work at the instigation of the Board of Destitution. Labourers came from unspecified origins to work on the roads but were probably only temporary residents. For example, with regard to completion of a small harbour at Cove, the

construction of which is recorded in the 1831 Census Enumeration, the Cockburnspath minister comments: "Several strangers (probably about thirty) have now left the parish" (N.S.A., Vol. II, p. 306: Cockburnspath parish). Another source of immigration was Ireland, from whence came seasonal labourers, many of whom settled permanently. This seasonal migration was timed to coincide with the Scottish harvest and, as ripening is earliest in the South East, it is hardly surprising to find Berwick a starting-point for their sojourn in the country. By the 1840s, the Irish influx had reached very large proportions and "at the Poor Inquiry of 1843, the superintendant of the Berwickshire police stated that 2,000 Irish came to Berwickshire annually for the harvest" (Handley 1945, p. 44). Of those that remained permanently, the majority appear to have settled in the towns where employment was available throughout the year. "Of the Irish, both native-born and by descent, in Hawick, the tweed manufacturing town of the Border county of Roxburgh, the Catholic Directory for 1846 estimated the number at more than 200, several of whom had been resident in the town for upwards of twenty years. Kelso, Jedburgh and Galashiels, other tweed towns, each had a group of Irish immigrants" (Handley 1945, p. 132). This element was apparently not always welcome: "It may be added, that late years have also witnessed the settlement among us of a few Irish; the gleanings of those immense annual swarms, whose successive emigrations threaten, if not speedily arrested, to lower and deteriorate to an extent

frightful to contemplate, the character and manners of the populace of this island" (N.S.A., Vol. 3, p. 322: Kelso parish). However, in 1841 the proportion of Irish-born in the county of Roxburgh amounted to an insignificant 0.7% and similar statistics are recorded for the other three counties: Peebles 0.9%, Berwick 0.5% and Selkirk 0.4%.

Between 1755 and 1840, therefore, it would appear that the population of the Border Counties was becoming increasingly mobile. Agriculture's decreasing labour requirements had resulted in a movement from the rural areas, first to the villages and later to the towns, especailly to those which were beginning to develop industrial functions. Most of this movement took place within the Border County area although the lure of the big cities and the New World took its toll. Up to 1860, however, out-migration did not keep pace with natural increase and the relatively small amount of in-migration, for, although several of the wholly rural parishes reached their population peak earlier, none of the counties as a whole had yet achieved maximum population. The 1860s seem to mark a turning-point in the migration pattern of the Border Counties, a point at which divergence occurs among the counties, both in the rate of migration and in its causal factors. It is fortunate, therefore, that more detailed and reliable statistics are available from this date.

Although the population of the Border Counties as a whole continues to increase until 1891, both Berwick and Roxburgh reached maximum population in 1861 and have recorded a decline in each

succeeding decade, except for a small increase in Roxburgh between 1921 and 1931. In Selkirk, on the other hand, 1861 marked the start of a thirty-year period of rapid growth. Peebles, however, continued to increase slowly but steadily until 1921. Thus, in three of the four Border Counties, 1861 presents an appropriate point in time at which to begin a closer investigation of the components which together cause population change.

(3) Fertility, Mortality and Migration as Components of Population Change

In the period between 1861 and 1961 (Table IV.1), the trend in the crude birth-rate in the Border Counties parallels that of Scotland as a whole and differs only slightly from county to county. The pattern for both the nation and the Borders is of a continuing decline in number of births per 1,000 persons, resulting in a 50% decrease over the hundred-year time-span. The most striking feature, however, revealed by Table IV.1 is the marked disparity between the sizes of the birth-rates in the Border Counties on the one hand and in Scotland on the other. Throughout the period, all four Border Counties, with the exception of Selkirk between 1861 and 1880, record a birth-rate much lower than the national average with peak divergence occurring about the turn of the century. The exceptionally high birth-rate in Selkirk at the beginning of the period was accompanied by a large influx of migrants, mainly young adults, and

this feature is examined in greater detail later. The generally lower birth-rate is a phenomenon common to most of rural Scotland but, unlike other areas, the fertility of marriage in the Border Counties is also very low — a rate in 1961 of 126.1 legitimate births per 1,000 married women aged 16-44 as compared with 147.5 for Scotland. The causes of this are not fully understood, and indeed Taylor (1962) enters a plea for detailed research into its determinants and consequences. It is to be hoped that sociologists will take up the challenge. However, it is suggested by the Scottish Office (1966, p. 96) that the current cause "may be related to the high proportion of women, including married women, who are at work in the textile factories and their relatively high standard of living". Partial corroboration of this suggestion may be found in Table IV.1 which shows a marked similarity in birth-rates during the period 1901 to 1910 but, since that time, the decline in the number of births has been noticeably slower in the more agricultural counties of Berwick and Roxburgh than in textile-dominated Peebles and Selkirk. While the birth-rate decreased throughout, the Roxburgh figures bear more resemblance to those of Peebles and Selkirk in recent years, corresponding to the period of change in the economic balance of the county from agriculture to textiles already discussed in the previous chapter. Thus, it is suggested that the birth-rate as well as the fertility rate is in some way related to the economic situation prevailing in each county.

The crude death-rates (Table IV.2), although initially considerably lower than the national average, have declined much more slowly, and indeed the most recent figures show an increase. At the beginning of the period, higher death-rates tend to correspond with higher birth-rates, especially in Selkirk between 1861 and 1880, revealing the impact of infant mortality at that time (See above, pp. 113-128). In the mid-nineteenth century, one of the main causes of deaths arose from the high incidence of epidemic diseases. Since poor, over-crowded and congested living conditions considerably enhance the spread of infectious disease, the resultant death toll was highest in industrial areas; witness the fact that in Glasgow the death-rate in 1861 arising from infectious diseases alone was heavier than that from all causes today. It is hardly surprising therefore that the Border Counties, comparatively unaffected by industrial expansion, recorded a much lower death-rate than the national average but that such differences as do exist among the four counties reveal that the greater the degree of industrialisation and urbanisation, the higher the death-rate, as shown by the figures below:-

	Berwick	Peebles	Roxburgh	Selkirk
Death Rate (mean 1861-70)	16.3	17.1	18.4	19.6
Percentage Urban (1861)	19.8	27.8	44.4	62.2

(Source: 1861 Census of Scotland and 1861-70 Annual General Reports of the Registrar-General for Scotland)

By the end of the century, the death-rates tend to even out and it is generally recognised that the difference between urban and rural death-

rates is no longer significant (see Registrar-General's 1954 Annual Report, 1955, p. 14). The slight increase in the death-rate over the last decade is a product of an ageing of the population. The most salient feature of Table IV.2 is the remarkably small change in the death-rates of the Border Counties over the hundred-year period and the fact that only very minor fluctuations occur within each county. It must be concluded, therefore, that the death-rate per se remains a relatively constant factor in the pattern of population change in the Border Counties between 1861 and 1961.

The net effect of the birth and death rates can be shown by the rate of natural increase — that is, the birth-rate minus the death-rate. The rate has been calculated and is tabulated in Table IV.4 while Table IV.3 shows natural increase in absolute terms. These two sets of figures provide a summary of the role of reproductive change in the population growth of the Border Counties and, were it not for migration, the figures in Table IV.4 would be synonymous with the rate of population change. It is immediately apparent that this life cycle process is not responsible for depopulation in the Border Counties since, with only two exceptions, natural increase would have resulted in an increased population. It would appear, however, that a weak and probably indirect relationship does exist since the greatest population decreases in Roxburgh and Selkirk coincide with dramatic falls in the rate of natural increase; from 13.0 and 13.3 to 6.1 and 8.4 respectively in the period 1891 to 1900. At the beginning of the period all four counties recorded an

above-average rate of natural increase, the lower birth-rate being more than offset by the lower death-rate, and except for Berwick this was maintained until the end of the nineteenth century. During the twentieth century, however, with the birth-rate decreasing rapidly and the death-rate remaining fairly constant, the rate of natural increase falls well below the national average and natural gain turns to loss in both Berwick and Selkirk.

Statistics for net migration have been calculated by subtracting natural increase from intercensal increase and the resultant numbers of net migrants are shown in Table IV.3. Unfortunately, it is not possible to distinguish between the in-migrant and out-migrant components of these net figures. However, it has been possible to calculate a rate of net migration which corresponds to the rate of natural increase tabulated in Table IV.4. This rate is one of annual average net migration per 1,000 persons expressed as a proportion of previous census population totals and is shown in Table IV.5. Unlike the rate of natural increase, that of net migration fluctuates considerably from decade to decade and from county to county. A comparison of Tables IV.4 and IV.5 reveals that there is little relationship between the two rates. Berwick records the most consistent migration trend reaching a peak of net out-migration in the decade 1881 to 1890, gradual decline from then until the 1950s when it rises significantly. Net out-migration from Peebles is relatively

constant throughout the hundred-year period with the exception of the periods affected by the two World Wars, and the decade 1871 to 1880 when the net outflow may have diminished by reason of the expansion in textile manufacture within the county. In Selkirk, the net migration pattern appears to be influenced most strongly by the fluctuating fortunes of textile manufacturing. The vast net inflow at an annual rate of over 54 per 1000, between 1871 and 1880 partially a result of boundary change (see Chapter II), not only ceased but, within the space of twenty years, changed to an outflow of 23 per 1000, a rate unparalleled in any of the Border Counties during the past hundred years. Since that time, however, out-migration has continued at a much slower rate. Roxburgh's net migration rate, as might be expected, reveals some features in common with Berwick and others which tend to parallel those of Selkirk. During the first thirty years, net out-migration ranks second only to Berwick's in volume, but decreases over the period rather than increases as a result of the partial absorption of redundant agricultural labour in manufacturing. Peak out-migration is achieved contemporaneously with that of Selkirk. During the present century, the out-migration diminished rapidly to the point where in the decade 1921 to 1931 the direction of flow was actually reversed, the resultant net in-migration of 36 persons being the only gain recorded in the Border Counties this century. However, the pattern of net outflow has re-asserted itself since that time, and, as in the other Border Counties, appears to be regaining momentum.

In order to summarise the consequences of the twin components of natural increase and net migration, a model devised by Webb (1963) has been adapted and applied to the Border Counties. From a Cartesian co-ordinate type of graph illustrated in Figure 56, eight types of population change can be derived by the dichotomous treatment of the two pairs of variables, natural gain/loss and migrational gain/loss. Although these eight types are to some extent artificial, the value of this typology is that it employs in a simple but rigorous way the two variables by which a preliminary accounting can be made for change in numbers of inhabitants. Although Webb used it for a large area, England and Wales, over a single decade 1921 to 1931, it is equally useful for summarising the population change in a smaller area, over a number of decades. In the case of the Border Counties between 1861 and 1961, types D, E and F are not represented.

In Figure 56, Berwick is shown as having the most consistent pattern of population change over the past hundred years. In spite of initial high natural increase, out-migration has continually exceeded natural gain until 1951. It is hardly surprising therefore to find that Type G replaces Type H in the most recent decade. At this stage, the demographic situation is one of an ageing and relatively childless population in which deaths exceed births, the result of a long history of out-migration of young people. Without a reversal of the migration flow, there would appear to be little hope for an improvement in the demographic health of Berwick.

In Peebles, the apparently rosy picture of natural gain outstripping out-migration for most of the period should be regarded with caution, since both components are small. Warning signals in the appearance of Type H are evident in recent times. When it is realised that the net migration stream is partially composed of in-migration on retirement, it seems likely that the current trend will rapidly deteriorate to Type G.

The trend in Roxburgh is akin to that of Berwick but with a hiatus occurring in the 1880s and again in the 1920s. The situation between 1931 and 1950 has been classed as Type A because, after adjustment for war losses, the estimated net out-migration was exceeded by natural gain. It should be noted, however, that the total population of the county in fact decreased by 231 persons over the period.

The extremely variable demographic history of Selkirk is clearly brought out by this model. Types B and C in the early stages are typical of an expanding industrial area, while the ensuing change to an alternating A/H pattern reveals the fluctuations in the rate of net out-migration. The occurrence of Type G may be regarded as atypical since it coincides with the depression and war years, although the recent increase in out-migration, combined with an extremely low rate of natural increase, is disquieting.

(4) Analysis of Migration from Birthplace Statistics

Having established and examined the volume of migration and

having considered its importance vis-à-vis natural increase in the population growth of the Border Counties, it seems desirable to pursue further the analysis of the migrational component. It is proposed, therefore, to examine direction of the migration flows by an analysis of its source and distance travelled. The only data available for such a study over the past hundred years are those derived from the census place of birth tables. That these are unsatisfactory on several counts has been noted earlier in this chapter, where their main shortcomings are listed. Provided that these limitations are recognised at the outset, it is possible to determine the pattern of migration streams from birthplace statistics over broad time-periods, and indeed such figures have provided the basis for most of the analyses of migration flows in the British Isles prior to 1961. The most important single contribution to the study of migration — that of Ravenstein (1885 and 1889) — was, in fact, based on an examination of place of birth vis-à-vis place of enumeration. His study of migration within the British Isles includes several references to the four Border Counties in that, because of their distinctive characteristics, they supply excellent examples of various facets of migration in 1881. Some of these are discussed later in this chapter.

In addition to those limitations already noted, one further problem arises which is of particular significance in the context of the Border Counties — the measurement of migration across the national

boundary. Because census statistics are collected and published in two separate units for Scotland and for England and Wales, it is not possible to trace migrants from specific counties in one country to any particular county in the other. As a result, one may only speculate on the volume of migration which has undoubtedly taken place between Roxburgh and Berwick on the one hand and the contiguous but English county of Northumberland on the other. The national boundary follows the line of the Cheviot watershed and the course of the River Tweed. Although these features may have acted as physical barriers in the past, they cannot be considered to have retained this function in recent times. Whilst the Cheviots may still prove to be something of a barrier to movement in so far as the routeways remain restricted and only run in an approximate north-south direction, this cannot be held to be the case for the River Tweed. Daily journey-to-work movement across the Border was revealed in fieldwork carried out in Swinton parish (see Chapter V). It is therefore reasonable to assume that migration of a more permanent nature has also occurred. If this is so in Swinton parish, the effect must be expected to be even more pronounced in parishes which lie along the Border itself. Furthermore, the large town nearest to much of Eastern Berwick, Berwick-upon-Tweed, lies on the English side of the Border and thus, in this predominantly rural area, initial rural to urban movement is most likely to have occurred by crossing the national boundary. The volume of this migration cannot be ascertained, however, and the problem of evaluating its significance was one recognised by

Ravenstein (1885). He notes (p. 179) that, in 1881, 62% of the natives of England and Wales enumerated in Scotland resided in the counties of Berwick, Roxburgh, Dumfries, Edinburgh Kirkcudbright and Lanark, further stating that "it is clear that the bulk of them are natives of the north of England, just as the bulk of the Scotchmen enumerated in England came from the south of Scotland." Indeed he later suggests in his classification of counties into those of absorption and those of dispersion (p. 185) that had it been possible to trace migrants from Northumberland into Berwick and Roxburgh, Northumberland would have been classed as a county of dispersion whilst, relative only to England and Wales, it must be described as one of absorption.

Thus the problem of migration across the border was recognised but unresolved by Ravenstein. Its solution appears no closer today, eighty-five years later. However, some indications as to its extent may be inferred. Table IV.6 shows that in-migrants from England accounted for almost 6% of the residents of Berwick in 1861 and that by 1961 the percentage had more than doubled although the absolute number of migrants had risen by only a quarter. A similar aituation is seen in Roxburgh (Table IV.8). Increased mobility with the passage of time has had more effect in the non-contiguous Border Counties of Peebles and Selkirk, however, where the percentage of English in-migrants has risen from 1.33% and 2.14% to 6.9% and 6.4% respectively (Tables IV.7 and IV.9). Since the Border Counties is

mainly an area of depopulation, it seems logical to expect that the counter-stream of out-migrants has been proportionately larger. This conclusion is supported by a comparison of the Registrar-General's estimates in the Annual Report with the migration tables of the 1961 Census of Scotland, Vol. 8. Net migration figures for 1960 to 1961, obtained by subtracting the natural increase from the difference between the Registrar-General's estimated total population for 1960 and 1961,[1] are shown in column 1 below. Based on a 10% sample, the net migration balance recorded by the 1961 Census of Scotland (Vol. 8, Table 4), which only takes account of out-migration within Scotland, is set out in column 2:-

	1	2
Berwick	-1080	-110
Peebles	- 455	-220
Roxburgh	-1765	-530
Selkirk	- 181	-110

Although these figures are not strictly comparable in that the Registrar-General's estimates refer to the calendar year 1960 whereas the census migration tables record figures for the year April 1960 to April 1961, far larger discrepancies are seen in Berwick and Roxburgh, the counties contiguous with England, than in Peebles and Selkirk. The difference must result chiefly from the untraceable migration outwith Scotland, the bulk of which is most likely to be

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1. Expressed as an equation, Net migration = (Estimated county population 1961 - Estimated county population 1960) - (Births 1960 - Deaths 1960).

movement to England.

There can be no doubt, therefore, that the volume of migration from the Border Counties to England attains sizeable proportions and is an element of particular significance in the out-migration from Berwick and Roxburgh. The absence of data covering the Scottish-English movements precludes any more detailed investigation of these migrations and the ensuing analysis of birthplace statistics must be confined, perforce, to movement within Scotland.

Since the use of place of birth figures tends to give a cumulative view of migration, a further limitation has been imposed on the extent of the study. Only four selected years have been chosen to portray the pattern of movement and although at first sight the choice of periods may appear to be arbitrary, being largely at thirty-year intervals, there is, in point of fact, considerable justification for 1861, 1891, 1921 and 1961 being appropriate and pertinent to this section of the analysis. First, the very fact that there is an interval of thirty years between each year of study allows for a generation to have elapsed since the previous period. Secondly, as already discussed, 1861 marks a turning-point in the demographic history of the Border Counties, while the 1891 figures should reveal the nature of the large inflow of migrants to the textile industry in the 1870s and 1880s. The 1961 figures are useful in that they can be partially verified and expanded by cross-checking with the 1961 census migration tables and also in that they represent the most

recent time-period for which the information is available. Thirdly, since place of birth tables provide figures relevant to lifetime migration, examination at a shorter time-interval seems unwarranted. Fourthly, certain additional information on migration in the Border Counties at other dates may be obtained from other research. Ravenstein (1885) covers the period 1871 to 1881, making frequent references to individual Border Counties. A general view of the situation in 1851, 1901 and 1951 may be found in the migration by place of birth analysis of the whole of Scotland by Osborne (1958). These two sources, together with the ensuing study, should provide a fairly extensive picture of population movements during the past hundred years.

The raw birthplace data may be used in a variety of ways. Most commonly, they are expressed as percentages of the total born or enumerated in the county as is done in Ravenstein (1885). These percentages may be expressed as a function of area as in Smith (1951), or net intercounty migration rates can be derived as in Osborne (1956, 1958 and 1964). However, although simple percentages have been calculated for the summary in-migration tables IV.6 to IV.9, a rather more sophisticated method is adopted for the main section of the analysis. It has long been recognised that the two strongest factors influencing migration are population size and distance. In order to eliminate the effect of the first, the ratios of actual to expected numbers of migrants were used in place of absolute numbers. The expected number of migrants was calculated for each county by the formula

$$E = \frac{P_i}{P_s - P_{bc}} \times M$$

where E = expected number of migrants, P_i = population of the i th county, i = 1 .... 32, P_s = population of Scotland, P_{bc} = population of the individual Border County, and M = number of migrants to or from that Border County. Thus the expected numbers of migrants are those which would be found if the known totals in and out were proportional to the male and female populations of the counties. These ratios have been derived for each of the four Border Counties for the years 1861, 1891, 1921 and 1961, each being differentiated into in and out, male and female. The ratios thus derived are shown in Tables IV.10 to IV.25.

The only migration differential analysed is that of sex. It has already been recognised that the volume of movement recorded at the given dates is an index of lifetime migration and does not relate to any specific point in time. Efforts to convert these lifetime data into age-specific estimates relating to intercensal periods have not been entirely successful. Friedlander and Roshier (1966) attempted such a conversion for England and Wales between 1851 and 1951. Based on this, they concluded that the largest proportion of out-migration from Northumberland and Durham was in the 20 to 29 age-group. These findings are not corroborated, however, by the North Regional Planning Committee (1967), whose extensive survey of the area by postal questionnaire revealed that while the 20 to 29 age-group was indeed mobile, their movement took place largely within the area and the region in fact showed a net increase in this age cohort. Migration

outwith the area occurred largely among the 0 to 15 and 30 to 39 age-ranges. Therefore, although an examination of the age structure of Border County migrants by the Friedlander and Roshier method was considered, it was felt that there was sufficient evidence to view statistics thus derived with some scepticism.

The degree to which the in-migration flow within the Border Counties is revealed by a study of migration within Scotland may be seen by examination of Tables IV.6 to IV.9. Here it can be observed that the numbers living in their county of birth vary from over 70% in 1861 to less than 40% in 1961. This pattern of decrease through time is complemented, however, by an increasing movement into the Border Counties from the rest of Scotland, with the result that the overall percentage of Scottish-born decreases only by a maximum of 7% over the hundred years under consideration. Of the non-Scots, approximately 75% are English, a proportion which has remained fairly constant through time although representing an increasing percentage of the total population. The percentage of Irish-born has decreased over the period, having been inflated initially by economic hardship in the native country. The inward movement from Wales is negligible throughout but shows a slight increase in recent times. Of those born outside the British Isles, the highest percentage is found in Peebles but at maximum represents only 2.63% of the total population. The study of in-migration within Scotland, therefore, is seen to relate to at least 85% of the total population of each county and up to 95%

in the nineteenth century. It is regretted that no comparable indication can be given as to the comprehensiveness of the out-migration analysis.

This examination of migration within Scotland is concerned initially with two main factors, population size and distance moved. However, the ratios of actual to expected number of migrants have been calculated with the express purpose of isolating the factor of distance from that of population size, by eliminating the effect of the latter. Prior to discussing this factor, therefore, its effect on absolute number of migrants should be examined. This feature is most strikingly revealed by considering the attraction of urban centres and their function as large sources of population dispersion. Since Edinburgh is the city which influences most strongly the migration pattern of the Border Counties, a summary of total migrants to and from Midlothian in each of the four years is given below:-

	1861		1891		1921		1961	
	In	Out	In	Out	In	Out	In	Out
Berwick	1412	3930	1078	5198	1447	2786	2196	2940
Peebles	1253	3635	1715	3427	2019	2763	2369	1764
Roxburgh	1776	3454	1688	5108	2009	6078	3273	3546
Selkirk	592	1019	1688	1457	1671	2870	1898	2168

(Source: Census of Scotland, Birthplace Tables)

Thus 15% to 35% of the total in- or out-migrants are involved in this flow alone. This indicates the importance of the location and the extent of the influence of Edinburgh. However, it also illustrates a second feature which is not so widely recognised: the importance of the counter-stream of migration. While it might be expected that

Edinburgh has provided a powerful attraction for the population of the Border Counties and that a rural to urban flow has long been established, the volume of in-migration from Midlothian to each of the Border Counties, initially less than half the outward flow, has increased considerably over the hundred years and is rapidly overtaking the volume of out-migration. Indeed, in the case of Peebles, by 1961 there were many more people moving away from the city than toward it, indicating the changing attitudes to urban living and increased mobility allowing commuters to reside at a greater distance from their work.

The relative importance, in absolute terms, of the largest sending and receiving counties is shown in Tables IV.30 to IV.33. Here, the five largest sources and destinations of migrants are listed in descending order of importance for each of the four Border Counties. Midlothian is revealed as the most important single destination heading the list in Berwick and Peebles and invariably in the leading two counties for Roxburgh and Selkirk. The influence of the county of Lanark (containing, as it does, a large proportion of the area of Glasgow) is also clearly seen, being represented in each of the out-migration. Tts attraction is most evident in Peebles, however, where the additional factor of contiguity must be recognised. The second feature exhibited by these tables is the interaction among counties which share a common boundary. This is well illustrated by the high position of East Lothian among the source counties of Berwick

in-migration and the inclusion of Dumfries in the Peebles and Roxburgh in-tables. Fihally, some comment must be made on the somewhat unexpected appearance of two counties in these lists: the presence of Fife in 1891 among the Berwick in-migrants, and also in the Peebles out-migrants in 1921 and 1961, and that of East Lothian in the Peebles out-migration list in 1861 and 1891. It is interesting to find that Osborne (1958) attributes the population expansion and in-migration of Fife and East Lothian to the growth of coal-mining combined with the development of associated industries, the naval port of Rosyth, and the popularity of the coastal settlements as residential areas. For the most part, the sending and receiving counties, listed in Tables IV.30 to IV.33, comprise over 50% of the total migrants in any one period. The other sending and receiving counties will be examined, therefore, in terms of distance only, since the absolute numbers of migrants tend to be rather small.

The second factor to be considered is that of distance. Here, the simple gravity model, that the volume of migration varies inversely with distance travelled, is accepted as a premise and, therefore, explanations are sought only for deviations from it. In order to simplify the analysis and ease the process of seeking patterns of movement from the 2,000 and more ratios shown in Tables IV.10 to IV.25, counties were grouped by the use of zonal distances. The system adopted is simple but one which has proved effective in other studies (Geary and Hughes, 1970). On a map of Scotland was drawn a series of

concentric circles with radii equivalent to 30, 60, 90 .... miles. The centre of the circles was taken as the largest population concentration within each county in that this was considered to be the point which acted as the main source of attraction for migrants.[1] The inner circle was then allocated the zonal distance of 1, the band between it and the next circle the zonal distance 2 and progressively outwards to zone 7. If the greater part of the area of a county lay within a zone, it was accorded that zonal distance. This procedure was adhered to for five zones. Thereafter, the circles were found to contain only one, or at most two, counties. Therefore, for obvious reasons, Ross and Cromarty, Caithness and Sutherland are grouped in zone 6, whilst Orkney and Zetland together comprise zone 7.

A third factor, contiguity, was examined in a similar analysis of Ireland by Geary and Hughes (1970). Although they concluded that the contiguity factor was highly significant, their justification for so doing appears less than convincing. In a regression analysis taking the ratio of actual/expected migrants as the dependent variable, Y, and zonal distance and contiguity (dealt with as a dummy) as the independent variables, they noted a considerable improvement of fit on a simple

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1. Peebles town, Hawick and Galashiels were obvious choices for Peebles, Roxburgh and Selkirk. In Berwick, the choice was less clear-cut but Duns was selected as it is the county town, centrally located in an essentially evenly dispersed population distribution, and approximately equidistant from the other three burghs in the county. In point of fact, it was found that the centre could be moved two or three miles without alteration in the zonal distances.

regression of Y on zonal distance. It is suggested that a multiplicative rather than an additive approach might have proved more conclusive. In the present analysis, therefore, contiguity is disregarded as a distinct variable but considered only as an extension of the distance factor. Viewed logically, the contiguity factor merely provides for an increase in migration by virtue of short-distance moves. This view may, in fact, be considered to be supported by the Geary and Hughes analysis where, in all but one instance, the contiguous counties examined were co-incident with counties of zonal distance 1.

The effect of distance on flow of migrants is perhaps most clearly revealed by the summaries provided in Tables IV.26 to IV.29. These show the average ratio for each zonal distance at each time-period. It is immediately apparent that in the Border Counties, as elsewhere, the volume of migrants varies inversely with distance. Because of the small numbers of migrants involved, especially in long-distance movement, a true mathematical progression cannot be expected and some aberrant values are bound to occur. These aberrants may well be the result of the somewhat arbitrary method of defining the zonal distances. This may be the cause, for example, for the average ratios of in-migrants in Roxburgh being consistently higher in zone 5 than in zone 4. Nevertheless, the progressive decrease in mean ratio values from zone 1 to zone 7 is remarkably consistent, especially in the outward movement, thus proving correct the initial assumption that, when the population factor has been

eliminated, the greater the distance travelled, the smaller the number of migrants (see above, p. 209).

A second feature common to all sets of tables is the extremely high ratios found within zone 1. In the Geary and Hughes (1970) analysis where zonal distance is synonymous with contiguity, this phenomenon is attributed to the contiguity factor. In the current study where zone 1 and contiguous counties are not coincident, the inclusion of some non-contiguous counties and the exclusion of contiguous ones should produce the effect of reducing the mean ratios in zone 1 and raising them in zone 2. This is clearly not the case. Even in Peebles, where most non-contiguous counties are found in zone 1, the ratios are seen to be higher than those found in Ireland. Obviously, the factors affecting the ratios are far more complex than mere proximity and it is suggested that, where these high ratios occur, account must also be taken of such spatial variables as the length of the common boundary, the area of the county, and the distribution of population within the county.

In both inward and outward movement within zonal distance 1, each of the Border Counties shows greatest affinity with the Border County or Counties adjoining it, the highest ratios being found where the common boundary is longest. If these were the only operational factors, however, equally high ratios would be expected between Peebles and Lanark, Peebles and Midlothian, Berwick and East Lothian, and Roxburgh and Dumfries where the same conditions are found. Although

the ratios here tend to be high except for the first, they appear relatively low in comparison with the inter-Border County ratios. The probable reason for this is the greater distance of the population centres in these counties from the common boundary. However, the close migrant relationship between Berwick and Selkirk cannot be explained in this way since these counties are non-contiguous, being separated by a portion of the county of Roxburgh. Yet the reciprocal movement between Berwick and Selkirk is large, becoming increasingly so to 1961. Clearly, the affinity among the Border Counties in terms of population movement overrides the contiguity factor and provides a certain justification for regarding the Border Counties as a population unit as well as a physical and economic one.

In zonal distance 2, deviations from the mean are very much smaller, though nonetheless significant. Here the highest ratios are found in movements between Berwick and Peebles providing yet further support for the conclusions drawn above. In Berwick and Roxburgh, where Midlothian occurs in this zone, evidence of the powerful influence of Edinburgh is revealed in ratios at least twice as large as those expected on the basis of population size. In both cases, however, the counties share a common, if short, border and this must be regarded as a contributory factor.. Unexpectedly high ratios are experienced in migration to and from Kinross from all Border Counties and also from Clackmannan. It is suggested that the inflation of these migration streams is associated with the textile industry in

both sending and receiving counties and that, once established, it was maintained by reason of the information flow between the counties together with the continuing economic similarities. In the case of Kinross, only small ratios were recorded in 1861, but these had risen considerably by 1891 to 2.86 for Selkirk's outmigrants, to fall again again in the twentieth century although remaining above the expected value.

Two other migrant streams which have become well developed through time to all four Border Counties are those to and from East Lothian and to and, more markedly, from South West Scotland. East Lothian lies within zonal distance 1 for all counties bar Roxburgh but adjoins only Berwick. A fairly strong migrant link has been established here and certain suggestions as to the cause have been discussed above. One further possibility should not be overlooked. Since the ratios are derived from birthplace data, the migration may have occurred by stages. Thus the flow may represent a movement down the Tweed Valley prior to turning north. This appears likely especially if the initial stage of the migration was undertaken in childhood or if the latter stage was a migration of retirement to the coastal residential areas of East Lothian. The affinity with South West Scotland becomes more marked through time and constitutes a greater inward than outward movement. The migrant interaction with Dumfries is not surprising since Peebles, Roxburgh and Selkirk are all contiguous, although it occurs in zone 1 for Roxburgh only. Because of this, the highest

ratios are recorded in Roxburgh, reaching peak in-migration in 1891. This high inward movement extends also to Berwick however, and may again be indicative of two or more stage migration since Dumfries lies at zonal distance 3 from that county. It is interesting to find a migration stream and counter-stream becoming established with Kirkcudbright through time, with higher ratios recorded at the later time-periods. Kirkcudbright lies in zone 3 for all Border Counties except Peebles. This flow pattern is extended to Wigtown by 1961 for all the Border Counties' in-migration, appearing as an extremely deviant ratio both in Berwick's and Selkirk's zone 4. However, as yet no counter-stream has developed.

In zones 5, 6 and 7, "rogue" values have less significance since distance is so great and absolute numbers of migrants so small. Some interesting features may be observed, however. The comparatively high outward mean ratio for Roxburgh in 1861 to zone 6 (and also to a lesser degree for Peebles) may provide evidence for the migration suggested earlier in this chapter, in the first half of the nineteenth century. However, elsewhere, allowing for increasing mobility over time, there appears to have been very little migration from the Border Counties to the Highlands or Islands or indeed any reciprocal flow during the nineteenth century. However, during this century inward migration to all four Border Counties from zones 6 and 7 is relatively high and for Berwick in 1961 the mean for zone 6 attains the "expected" number: that is, a ratio of 1.00. The

explanation of this must be purely conjectural. The probability of a several stage migration is high and one such movement might be a migration to Edinburgh for educational or vocational training followed by a movement further south on employment or marriage. Since the migration is female dominant, it is suggestive of bridal movement. Alternatively, with high female employment opportunities in textiles and tourism, the attraction could be economic. However, this seems unlikely if one accepts Lee's (1966) "intervening obstacle" theory. Furthermore, it does not explain the fact that the highest ratios for these zones are recorded in Berwick.

The only demographic differential which may be satisfactorily examined in relation to this migration study derived from birthplace data is that of sex. That "females are more migratory than males" is one of the laws of migration propounded by Ravenstein (1885, p. 199). Table IV.34 clearly shows this to have been true of the Border Counties not only in the 1880s but through time to 1961. Although the 1861 in-migration to Roxburgh is the only instance of males exceeding females, a certain pattern emerges from the migrant sex ratios. Prior to 1861, the sex ratios among out-migrants were higher than those of in-migrants except in Selkirk. The reason for this is not hard to find. Up to this date, the economy of the Border Counties was based on agriculture, a predominantly male employer. In addition, it has been noted in earlier chapters that a relatively high proportion of immigrant male labourers were enumerated

in the 1861 Census of Scotland especially in Roxburgh — for example in Castleton parish, where they were engaged upon railway construction — hence the male-dominant ratio. The amalgamation of farms, so prevalent in the early nineteenth century, had two main effects. The first was the displacement of whole families which would result in approximately equal male and female migration. The second was the associated reduction in numbers employed in domestic service, causing a predominantly female out-migration. The exception recorded here in Selkirk is doubtless indicative of the early start of the textile industry in that county. By 1891 the emphasis had changed with in-migration providing the higher sex ratios, again with the exception of Selkirk. The highest ratios, 125.1 and 131.4, were recorded in Peebles and Roxburgh respectively, while Selkirk shows the very low, though still female-dominant, ratio of 103.2. This is taken to be indicative of the continuing expansion of the textile industry in Peebles and Roxburgh while that of Selkirk had passed its peak. The increasing lack of employment for men resulted in male out-migration, giving out-migrant sex ratios close to parity. In 1921, in-migrant sex ratios were higher still, being over 130 in each of the three textile counties. These inflated values are presumably due to the temporarily but substantially increased productivity in the mills during World War I. Female dominance is considerably lower in Berwick's in-migrant sex ratios. The ratios for out-migrants again approximate to parity by comparison, but ratios are higher in Berwick

than in the other Border Counties. The 1961 figures present an interesting situation. The highest sex ratio for any period, 141.8, is recorded for Berwick's out-migrants while the in-migrant ratio is only 110.8. It is suggested that this is caused by the greater opportunity in the county for male employment, not only in agriculture but also in such industries as are located there, for example fishing and paper-making. With little prospect of employment, therefore, females displayed the greater propensity to leave. High ratios are recorded for inward movement into Peebles and Selkirk, probably. A lower ratio is seen in Roxburgh where there is greater diversity in the economy. Thus far, economic causes only have been put forward in explanation of the high sex ratios witnessed among migrants. However, the Ravenstein (1885) hypothesis must be accepted as a migration law applicable to all counties including those of the Borders. One type of movement which is mainly female-orientated is migration on marriage. This must be considered as a universal feature resulting in an overall female-dominant migrant sex ratio, and explanation of inflated values such as those found in the Border Counties must be sought elsewhere, as has been attempted above.

Ravenstein (1889, p. 288) qualifies the law formulated in his earlier paper by concluding that "females appear to predominate among short-journey migrants"; the implication being that males predominate over long distances. In order to test this hypothesis over time and in the context of the Border Counties, the sex differential,

portrayed by the ratios in Tables IV.10 to IV.25, will now be examined briefly. The marked similarity between male and female ratios which was noted in Ireland by Geary and Hughes (1970) is not so apparent in the Border Counties, and a disparity in the sex differential is also found between in-migrants and out-migrants. Taking zone 1 as representative of short-distance movement it will be seen that predominance of male and female movement is roughly equal over the hundred-year time-span for both Berwick and Roxburgh, with a tendency for greater female migration in the nineteenth than in the twentieth century. In Peebles and Selkirk, however, female migration tends to dominate throughout. Medium-distance movement tends to be male-orientated while longer-distance migration, involving zones 6 and 7, is mainly higher among women. Over all, inward movement is shown to be predominantly female from all zones at all periods whilst out-migration is more frequently male-dominant except for short-distance nineteenth-century moves. It is concluded, therefore, that Ravenstein's theory of 1889 is not supported by the evidence found in the Border Counties. Nevertheless, this conclusion should not be read as invalidating the Ravenstein law. Such a contrary result must be expected in an area so economically biassed toward female inflow and male out-migration. However, the findings of this analysis suggest that the law may have to be modified by inbuilding variables.

The conclusions drawn from this analysis of migration from birthplace data may be summarised as follows:-

(i) The Border Counties tend to function as a population unit in terms of migration.

(ii) Increasing mobility through time has resulted in a higher percentage of the population being involved in migration in recent years.

(iii) Contiguity is not found to be the simple but important independant variable suggested by Geary and Hughes (1970) but a complex phenomenon incorporating, or affected by, a number of other spatial variables, its alleged strength being frequently over-ridden by the affinity among the individual Border Counties.

(iv) Outward movement is more consistently governed by distance than in-migration.

(v) The counter-streams produced are initially of "feebler strength", as Ravenstein (1889, p. 287) suggests, but increase in volume over time and, as in the case of Peebles, may eventually exceed the original flow.

(vi) The great majority of migrants make short-distance moves but this feature probably would not be so pronounced but for the close proximity of Edinburgh.

(vii) Women are more migratory than men.

(viii) In-migration is more markedly female-orientated than is the outward movement.

(ix) Short-distance and long-distance movement is overwhelmingly female whilst medium-distance migration tends to be male-dominant.

(e) Causes of Migration

Thus far, the volume of migration flows, their origins and destinations and the extent to which they are affected by the sex differential have been examined as extensively as available data permit. The most difficult problem in studying migration, however, is to discover its causes. Basically there are two possible lines of approach.

The first method of investigating motivation is to conduct a survey by questionnaire seeking information on reasons for past migration or causes of possible future movement by means of "desire to migrate" questions. Two such surveys have been undertaken in the Border Counties in the past twenty-five years: the first by Hutchinson (1949) on behalf of the Department of Health for Scotland, the second by Galt (1968) as part of a Ph.D. thesis at the University of Edinburgh. The 1948 survey examined a sample of 2,648 persons throughout the Border Counties but excluding the towns of Galashiels and Hawick. A wide variety of questions relating to social factors in rural planning were asked and the results are summarised in 132 tables in Hutchinson (1949). A brief summary of the findings relative to migration is included here. Of the 698 persons born outwith the Border Counties, the majority (53%) settled there as a result of employment opportunities, 16% came as children with relatives and 12% moved to look for work. Other reasons given included:

to obtain a house (4%), to retire (4%), and "relatives-in-law here" (migration on marriage?) (3%). Only 9% of the survey sample expressed a desire to move away from the area. Of these, 28% stated that they wished "to get a better job and/or better wages", 21% complained of loneliness and "nothing happening", 15% desired "a change", 12% wanted to be nearer relatives and 5% were prepared to migrate for the sake of their children's future. Only 1% thought poor weather conditions sufficient grounds for migration. The largest proportion of these potential migrants (26%) wished to move to England, Wales or Northern Ireland. Other desired destinations were given as Edinburgh or Glasgow (18%), other Scottish rural areas (14%), other Scottish towns (10%) and abroad (9%). The extent of past migration was assessed at second hand by asking the question, "Have any of your relatives or former members of your household moved away from this part of Scotland since 1919?" Of the 434 out-migrants since that date, 40% had moved to England and Wales (including London), 33% to Glasgow or Edinburgh, 14% to other Scottish towns and only 1% to other Scottish rural areas. Reasons given for these moves were, to obtain employment or better prospects (46%), to get married (32%), and "to enter, or train for, a specific job" (16%).

The Galt survey, conducted in 1967 on a similar basis but on a much smaller scale (by sample households in sample parishes), revealed that motivation appeared to have altered little in the intervening twenty years. Out-migration of relatives was said to be caused

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mainly by better employment opportunities elsewhere, especially for males, while a significant proportion moved on marriage, particularly the female element. Although no figures are given, it would seem that a larger proportion of the in-migrants were found to have moved on retirement than was the case in 1948. In response to "desire to move" questions, the reasons stated re-iterated the views expressed twenty years before, namely better employment opportunities, better shopping and entertainment facilities and better schooling for families.

It is difficult to assess the value of these or indeed of any such surveys into the motivation of migrants. Much criticism has been levelled in recent years at the accuracy of opinion polls for they have proved unreliable indicators of how an electorate will vote within one week. In the case of migration, the respondents were asked to supply reasons for moving one or many years previously, for a hypothetical move in the indeterminate future, and even to impute motives to the movements of third persons. In the first case, the migrant will attempt to rationalise and justify his action, especially if the move did not live up to expectations. The second type of answer may indicate only wishful thinking and bear little relationship to the motivation when, or even if, the migration occurs. The discrepancies in the 1948 survey between the destinations of past migration and those of potential migrants could reveal a real change in attitude or merely show that castles in Spain are preferable to tied cottages in the Border Counties. In the last instance, a third person may be able to perceive the migrant's motives more objectively,

but it is surely equally probable that the real causes were never expressed by the migrant himself. For example, parents may not know that their children moved merely to escape the home environment or, if they do, are unlikely to admit it but will attempt to rationalise the migration in other terms. Thus while motivation surveys go some way toward substantiating, for a given area, the fact that the major motivating factors are socio-economic in origin, to use data thus derived as a basis for further statistical analysis is to endow them with spurious accuracy. Nothing has been said so far of the bias inherent in the two surveys of the Border Counties, but an analysis of past migration on the basis of questions answered by close relatives remaining in the area will obviously place undue emphasis on the young single adult and omit wholly moving families. Admittedly, the young single sector of the population is probably the most mobile but the motives behind the decision to move taken by a married person, thereby instigating the migration of two, four or even more individuals, are obviously of proportionately greater significance. The scale of a survey which would include a representative sample of all migrants is undoubtedly beyond the scope of the individual research worker. In view of the inherent difficulties in conducting such a survey and the questionable reliability of its findings, it was considered unwarranted to collect further data of this nature.

The second method of investigating motivation is to examine the demographic characteristics of the migrant himself. Unfortunately,

as already discussed, data of this nature are not available over the whole time- period. However, a certain amount of information can be obtained from the survey undertaken on a 10% sample basis as part of the 1961 census enumeration. In the 1961 Census of Scotland (Vol. 8, Internal Migration), a migrant is defined as anyone whose usual address on census night (23rd April,1961) was different from his or her usual address on 23rd April, 1960. The term immigrant refers to all those who moved into the enumeration area from elsewhere, whereas the use of the word emigrant, as in the analysis of birthplace data, is restricted to movement to another part of Scotland. No account is taken of those who moved outside Scotland. Migrant characteristics are recorded chiefly at Regional Subdivision level. Thus, in the context of the present study, the smallest area for which such figures are available is the whole of the Border Counties, although the undifferentiated statistics for numbers of migrants are also recorded at county and even burghal level. However, the magnitude of the numbers involved both for counties and for the regional sub-divisions is so small that even percentages derived therefrom are "particularly liable to chance errors" according to the Registrar-General. Clearly, if more elaborate statistical analyses were attempted, they would be subject to gross inaccuracy. For these reasons, the figures derived from the 1961 internal migration tables are reviewed below at regional sub-division level and in terms of absolute numbers of migrants.

The total number of immigrants into the Border Counties between 1960 and 1961 was 2,820, 1,320 males and 1,500 females, whereas the number of emigrants from the area to elsewhere in Scotland only amounted to 980 males and 1,090 females, a total of 2,070. The resulting net in-migration balance is more apparent than real with the omission of external emigrants. Both the inflow and the outflow are female-dominant. Approximately one third of all immigrants came from the East Central Division whilst two thirds of the outflow headed for this area. In both streams, the female element greatly exceeded the male. Migration to and from the other Divisions was predominantly male, although the greater number of immigrants from the two Sub-Divisions containing the cities of Glasgow, Aberdeen and Dundee were women.

The statistics relating to migration characteristics as opposed to origin and destination are based on total migrant figures: that is, those who moved within the area in addition to immigrants and emigrants. On this basis, the total in-migrant figures were 4,720 males and 5,130 females. It is difficult to assess from Tables 9 and 10 in Volume 8 of the 1961 Census of Scotland which ages are the most mobile, since the age-groups into which they are sub-divided are of different lengths. However, a rough estimate may be derived by averaging for quinquennial periods and, on this basis, the most mobile group for both sexes was the 0 to 4 cohort. Above this age, the 25 to 44 group contained most male migrants whilst females in the age

range 15 to 24 were most migratory. The smallest number of immigrants, both fale and female, was found in the 65+ cohort. This ranking reflects the pattern for Scotland as a whole. Of the 4,380 male and 4,720 female emigrants, a parallel age-pattern of mobility obtained. The major difference lay in the larger numbers of migrants aged 65 and over, but it is not possible to estimate a quinquennial average owing to the indeterminacy of the upper age limit. Obviously no comparative emigrant estimates are available for the whole of Scotland.

The occupation differential is recorded for immigrants only. Of the 1,440 economically inactive male migrants, 330 were retired and 1,100 were under 15 or students. 3,570 women were enumerated as inactive, 120 of them retired, 1,020 under 15 or students, the remaining 2,370 classified as "others", presumably housewives. A total of 3,280 migrant men were economically active. The largest numbers were employed in agriculture, forestry and fishing, three times as many as in any other occupational order. Those employed in textiles came next, followed by significant numbers (i.e. 200 or more) in services, sport and recreation, transport and communication, sales, engineering, and the professions. There were as many migrations "within a local authority area" as "between local authority areas within Scotland". Of the former type, twice as many occurred in burghal areas as in landward areas while the most common distance moved was 15 to 39 miles, closely followed by 40 miles and over.

Of the 1,560 economically active female migrants, more were employed in textiles and clothing than in any other occupation, although the numbers recorded in "service" were almost as high. Clerical and professional workers were the only other orders where over 200 women were employed. Almost half of this migration occurred in burghal areas within a local authority area. Inter-area moves were most frequent over the 5 to 14 mile distance. Unlike the conclusions drawn from the birthplace data, the figures from this survey imply agreement with the findings of Ravenstein (1889) that female migration predominates over short distances. The apparent disparity results from the difference in basic definition of migrant.

In summary, the census internal migration tables imply that, while females are more migratory than males, the male Border County migrant is most probably aged 25 to 44 and agriculturally employed. He is as likely to move to or within a burghal area as to or within the landward area and tends to move over greater distances than his female counterpart. Women Border County migrants on the other hand are younger, aged 15 to 24, and mainly economically inactive. If employed, they are most likely to work in textiles or in domestic or recreational service, moving shorter distances to or within a burghal area. Evidence of the importance of epiphenomenal movement is quite clearly illustrated by the type and distance of move of economically inactive females, largely housewives or children, which mirrors that of the economically active male but is numerically greater.

Taken in conjunction, the findings of the opinion and the factual surveys suggest that the motivation behind migration in the Border Counties is largely socio-economic in nature, but associated with the age and sex structure of the population as a whole. In view of this, the final stage in this analysis of Border County migration is an attempt to establish to what extent a relationship has existed since 1961 between migration and these demographic characteristics.

Up to this point, various components of the population geography of the Border Counties have been isolated for detailed analysis. In reality, such isolates do not exist but form part of a complex and highly inter-related whole. Indeed, throughout this thesis, it has become increasingly apparent that changes in one component must be explained in terms of its interaction with other demographic variables. This was very noticeable in the analyses of age and sex but even more so in this study of migration. Here, the selected components have been integrated to form a meaningful whole, for migration has been shown to be age- and sex-selective and would appear to be predominantly motivated by economic circumstance. It seems appropriate therefore to conclude this chapter by attempting to measure quantitatively the relationship between migration and the various aspects of demographic change selected for analysis in this thesis.

By means of a multiple regression analysis, it is hoped to determine the extent to which depopulation due to migration is related

to the areal distribution and the age, sex and employment structures of the Border County population over time. For this analysis, the negative net migration rate over decennial periods between 1861 and 1961 was taken as the dependent variable, Y. The values of Y are therefore shown in Table IV.5 and the procedure used to obtain the data is described earlier in this chapter. Since net inward (i.e. positive) migration occurred in Selkirk between 1861 and 1871 and 1871 and 1881 and in Roxburgh between 1921 and 1931, these three periods are excluded from the analysis, giving a sample size of thirty-three.[1] However, prior to examining the relationships between this and the independent variables, it must first be formally established that migration is the main component in depopulation. This was determined by a simple regression of percentage intercensal change in total population, on the net out-migration rate. The resultant correlation coefficient of 0.91, significant at the 99% confidence level, indicates that migration far overshadows natural increase in accounting for intercensal population change in the Border Counties between 1861 and 1961.

It has been shown in this and previous chapters that urban/rural distribution, age structure, sex composition and occupational structure are all areally and temporally associated with migration. An

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1. Although the sample used is a 100% sample of all known values meeting the specifications for the dependent variable, it is assumed to have been randomly drawn from a hypothetical universe of possibilities.

attempt must now be made to identify specific factors which have been shown to be causally related to outward migration. From the findings of the present study and of previous research, for example the Hutchinson (1949) and Galt (1968) surveys, seven independent variables were selected for statistical analysis: the proportion of non-burghal dwellers, the proportion of the population aged 20 to 39, the proportion of the population aged 65 and over, the ratio of females per 100 males, the proportion of the total labour force who were employed, the proportion of the economically active employed in agriculture, and the proportion of the economically active employed in textiles. All data were calculated from figures recorded in the censuses of Scotland. Since all the independent variables were regarded as causal factors, the data used are those relating to the situation at the beginning of the period of migration.

Before setting up the hypotheses, some general comment on the nature of the data must be made. Throughout this thesis, it has been found that the data available have repeatedly fallen short of the desirable, but at no time more so than in the present context. The independent variables listed above cannot be considered as the most significant measures of what they purport to test. For example, change in the number of employees in agriculture would have yielded a more satisfactory variable than proportion employed in agriculture, on the grounds that the former provides a direct measure of contraction in agricultural labour thereby causing out-migration. The

impossibility of measuring change in the occupation structure over time because of changing classification systems was fully discussed in Chapter III. To introduce wittingly such sources of probable gross error would be inexcusable. Furthermore, the units in which the variables are stated are all proportions rather than absolute numbers, although the latter would have been statistically preferable. Again, the non-comparability of data over time is the cause. Age statistics were recorded by registration rather than civil counties for the earlier years, whilst numbers employed prove difficult because of the changing lower age-limit of the labour force. The alternative was to exclude the early years from the analysis. This was undesirable on two counts: first, the out-migration rate was highest during the nineteenth century; and secondly, the reduced sample size would have rendered a statistical analysis meaningless. At this stage, due consideration was given to the question of whether the analysis should be abandoned. The decision to continue was taken by reasoning that if significant correlation was found with any of the independent variables as defined, a closer correlation might exist for more satisfactorily defined variables, had these been possible. Therefore, high correlation coefficients are not expected to result from the correlation-regression analysis, nor is it expected that a large amount of variation in the dependent variable will be explained when the independent variables are considered simultaneously. It is hoped, however, to obtain some degree of support for the

hypotheses as stated below.

It has been shown in a large proportion of the research on migration in general that the main movement is from a rural to an urban environment. It is hypothesised, therefore, that where this source of migrant supply is greatest, the largest net out-migration rate will be experienced. Thus the first independent variable, X_1, was taken as the proportion of non-burghal (i.e. essentially rural) dwellers.

It is widely recognised that, with regard to age, the most mobile section of the population is the young adult group. The proportion of the population aged 20 to 39 was therefore taken as the second variable, X_2, the hypothesis again being that the larger the source, the higher the outward movement.

The proportion of the population aged 65 and over was selected as a third variable, X_3. This age-cohort is generally recognised as the least mobile section of the population and those who do migrate, move on retirement. Since the Border Counties is frequently regarded as an area attractive to the retired, it is postulated that the greater the proportion of those aged 65 and over the smaller the net outward migration.

Where imbalance exists there is a tendency for the situation to adjust so that balance may be regained. It is thought that, over time, this argument would prove valid with regard to the sex ratio, X_4. Since high sex ratios are recorded in the Border Counties and since

it has been shown earlier that migration is female-dominated, it is hypothesised that high sex ratios will result in a larger rate of out-migration.

Proportion of the total labour force in employment was included as an independent variable, X_5, as it is a factor which has been proved to be correlated with net migration in the United States. In the Border Counties the converse of the argument applied by Kariel (1963) is assumed in that, whereas he was examining areas of population growth, the present study seeks explanation for depopulation. The variable appears to measure indirectly the employment opportunities of an area. It is hypothesised therefore that where the employed proportion of the total labour force is smaller, the rate of net out-migration will be larger.

The proportion employed in agriculture, X_6, is in some ways a measure similar to X_1 in that a large percentage of those leaving the rural areas have been engaged in farming. Since contraction of farm labour has been a ubiquitous phenomenon over the period of study, it is argued that the larger the proportion of agricultural labour, the larger the net outward migration.

The final independent variable, X_7, was taken to be the proportion employed in textiles. Here the reverse of the argument applied to the agricultural labour force would appear to be valid, inasmuch as during periods of upsurge in the textile industry high employment and employment opportunities will result in in-migration, thus

reducing the net outward flow or reversing it. Therefore it is hypothesised that the proportion employed in textiles will be smaller when the net outward migration rate is larger.

A correlation-regression analysis was used to test these hypotheses. Since independent variables X_6 and X_7 are componential of X_5, the multivariate analysis was undertaken in two parts, 1 and 2. The results of these analyses are presented in Table IV.35.

These results show that only one of the seven hypotheses is supported by the correlation-regression analyses. Thus, where there was initially a larger proportion of non-burghal dwellers, the rate of net out-migration during the ensuing decade tended to be greater. However, the proportion of explained variation in the dependent variable, as given by the coefficient of determination (r^2), was relatively small.

Of the other four variables in multiple regression analysis 1, that which showed the highest correlation coefficient, X_2, is seen to be least significant from the computed t value, while the most significant, that is, significant at the 90% confidence level, X_4, has the smallest correlation coefficient. The hypothesis that the higher the net out-migration, the larger the proportion aged 20 to 39, is shown to be invalid since the regression line has a negative slope. As there seems to be little logical explanation for this, the reason must lie in an unsatisfactory definition of the independent variable. As explained above, a more desirable factor would have

been change in numbers aged 20 to 39 and it is thought that, had these data been available, this definition might have proved to be a better predictive variable. With variable X_3, the proportion aged 65 and over, a similar argument can be advanced. However, two further points must be raised. First, variation in X_3 tends to be small and is therefore unlikely to result in high correlation; and secondly, it has been noted earlier that in 1961 a larger number of this age-group was involved in outward movement than in inward migration. It may follow, therefore, that the Border Counties are atypical and that the 65+ age-group here tends to form part of an outward movement. A possible explanation may be found in the prevailing tenure system of tied cottages which must be vacated on retirement, resulting in out-migration. The lowest coefficient of determination is found for X_4, the sex ratio, which accounts for only 1% of the variation in Y. Further research on the relationship of this factor to the other independent variables might prove informative here. The result of the regression of X_5 on Y is interesting in that this is one of the factors analysed by Keriel (1963) for the United States. He found a high degree of correlation between size of the employed labour force and net in-migration, accounting for some 44% of the explained variation in the dependent variable. It is shown that this type of variable is not significantly correlated with net out-migration and that the converse of his hypothesis does not hold for the Border Counties. However, it should be noted that the variable as defined

by Keriel was for a single time-period and therefore the data were not subject to the variations found in those for the Border Counties.

When all five variables were considered simultaneously, over 22% of the variation in the dependent variable was accounted for (coefficient of multiple correlation = 0.48). This was an increase of a little over 12% in the amount of variation accounted for in the simple correlation analysis by the most closely related independent variable, proportion of non-burghal dwellers.

In multiple regression analysis 2, the economic variables X_6 and X_7 each show coefficients of determination higher than that for X_1, but the t values are very low, giving low confidence levels. Again, unsatisfactory definition of the variables may be responsible for this, as suggested earlier. Although each variable accounts for some 11% of the variation in net out-migration, when taken simultaneously, the amount is only 12% (coefficient of multiple correlation = 0.35). This suggests that the two factors tend to be complementary, thereby providing some support for the conclusions drawn in the study of occupational structure in Chapter III.

Because of the limitations imposed on the correlation-regression analysis by lack of data, it has been shown that the relationships between the demographic variables of the Borders population selected for study in this thesis cannot be satisfactorily quantified by this technique. It is possible that the use of probability models, such as that involving Markov chain processes, might prove more successful. However, the data derived from the 100% enumeration of migration in

the 1971 Census of Scotland, provided that they are eventually made available on a 100% basis, should prove susceptible to more rigorous statistical analysis.

Although the attempt to measure the relationships quantitatively has not been wholly successful, the results do not negate the correlations already established between the variables by other methods. Indeed, assuming the low confidence levels to be a result of unsatisfactory data, the analysis tends to corroborate the conclusions drawn previously that correlation exists between migration and the rural/urban factor, the age structure, and the specific economic variables. Although the sex ratio has proved to be a poor indicator of correlation in this quantitative analysis, the close interaction between migration and sex has already been effectively proved in both this and the previous chapter. It would appear, therefore, that the factors chosen for detailed investigation have all played a significant role in the depopulation of the Border Counties through migration.

C H A P T E R V

SPECIAL STUDIES

CHAPTER V

SPECIAL STUDIES

The Border Counties cover an area of 1,700 square miles, comprising a total of 83 parishes and a combined population in 1961 of 100,828. Although parts of the foregoing investigation have been conducted at parish level, it is inevitable in an area of this size that an analysis of demographic change over two centuries must result in generalised conclusions, referring to the average situation either at county level or in the study area as a whole. It is proposed, therefore, to analyse in depth four smaller units within the Border Counties. Thus, by turning from the general to the specific, it is hoped to determine the extent to which generalised conclusions remain significant at a local level. Conversely, this detailed examination may provide further insight into the broader problems encountered earlier.

The second aim of this chapter concerns developments which have taken place during the 1960s. Ten years have elapsed since the publication of the last available census and during that period further demographic change has occurred in the Border Counties. Although the analysis in the earlier part of this thesis ends at 1961, an opportunity is here presented to update population trends by field

study in the areas selected for special investigation. Some of the information thus obtained will eventually become available when the 1971 Census of Scotland is published, but much of it will not be revealed at parish level. The second aim, therefore, is to provide, for widely variant if localised environments, some indication of the current demographic trends within the Border Counties.

Three methods of selecting the areas for special study were considered, namely by random sampling, by stratified sampling, and by purely subjective testing. Random sampling and subjective choice are methods which are diametrically opposed: the former requires that each member of the "population" should have an equal chance of being selected while the latter is, by definition, totally biassed. Stratified sampling tends to be an admixture of the two. Each method was used to obtain a 5% sample and each, as might be expected, gave totally different results. With the parishes listed by county on an alphabetical basis, the Table of Random Sampling Numbers (Lindley and Miller 1953) resulted in Hutton, Teviothead, Langton and Tweedsmuir as the sample parishes.

The parishes were stratified on the basis of their locality in combination with their economic characteristics. The Border Counties were sub-divided into areas of lowland, hill, and upland farming types (as defined in Chapter I) and, since the other major feature of the economy is the textile industry, the textile towns were taken as a fourth stratum. Some twenty parishes were excluded

from consideration either on account of their transitional character or because they contained one of the six non-textile burghs. These strata within the "population" were then subjected to the random sampling process which resulted in the parishes of Ancrum, Kirkling and Tweedsmuir and the town of Selkirk.

For the subjective sampling, a matrix was constructed for each of the strata defined above, using a wide variety of criteria. Most weighting was given to the minimum population total, the extent of boundary changes and the number of fluctuations in population totals over the two-hundred-year period. Consideration was also given to such factors as the dates of maximum and minimum population, the degree to which the parish was physically typical of the area which it represented, and the extent to which adjacent parishes might be expected to have influenced the population patterns. For the lowland parishes, for example, the matrix analysis in the first stage gave the choice of one of four parishes, Eccles, Edrom, Hutton or Swinton. The second stage of the process was then applied and, in this instance, Swinton was found to conform most closely with the desired requirements. By a similar method of analysis, Lilliesleaf was selected as representative of the hill area, Ettrick of the upland zone, and the burgh of Hawick of the textile towns.

Of these three methods, stratified sampling seemed to gain little advantage over subjective testing, since bias has already been introduced (see Huff and Geis 1954, p. 21). Indeed, it appeared more

logical to make use of the bias in order to surmount problems of non-comparability (stemming from parish boundary change) and of a non-representative population (arising from a very small parish population total). Thus, there remained the choice between parishes selected by random sampling and subjective testing. In the random sampling selection, both Hutton and Langton appear to be fairly satisfactory as parishes for special study. However, Teviothead and Tweedsmuir present some difficulty in that the former parish was created only in 1851 and underwent extensive areal expansion in 1893, while Tweedsmuir's population falls to a minimum of 190 — a situation where the migration of one family of five persons would result in a 2.5% change in the population — and is further complicated by the 1901 anomaly (see Chapter II). Furthermore, two of these four parishes lie within the upland area of the Cheviots. It was felt that this would place undue emphasis on this sparsely populated zone. It was decided, therefore, that the parishes chosen on a subjective basis should be those used for special study.[1]

Much of the data for the special study areas has been obtained from census returns but, in view of the time-lapse since the last census in 1961, a field survey was undertaken in the three rural parishes during October and November 1970. Late autumn proved to

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1. Areas which have been the subject of detailed investigation in previous research work include Lauderdale, Coldingham Moor, Eyemouth and Teviothead by Mears (1949) and Broughton and Westruther by White (1951).

be a suitable time of year for such a survey in that few people were absent from home whilst holiday cottages were not occupied by temporary inhabitants. The questionnaire, shown in Appendix B, was designed to provide information similar to that used in the earlier sections of this thesis and extracted from the censuses. The questionnaire was kept as brief as possible in an effort to obtain fullest co-operation of the householders, and all questions sought factual information rather than statements of opinion. Each household was visited and the returns completed by the investigator. Where, after a second visit, no reply was obtained, the questionnaire was left with a request to complete and return it by post. The response elicited by this personal approach fully justified the considerable time involved in its execution. In Ettrick parish a 100% sample was obtained, while in Lilliesleaf there was a 91.7% response and in Swinton 93.5%. It was decided not to extend the field survey to the burgh of Hawick for several reasons. Because of its urban character, and the high proportion of working wives, it was anticipated that greater reliance would have to be placed on postal returns. Previous personal experience, and that of other research workers, suggests that this would have resulted in a much smaller sample. Moreover, the Census of Scotland provided 10% sample data for the burgh of Hawick in 1966, together with some data on a 100% sample basis as part of their special study enumeration of the county of Roxburgh. Weighed against this are the difficulties experienced by a single research worker in attempting to collate statistics for some 16,000 individuals.

It was thought that the greater accuracy of the census material would prove more valuable than the possibility of a larger sample size resulting from fieldwork, should such a survey have proved feasible. Thus, the most recent figures for Hawick cited in this chapter refer to 1966 and have been derived from the 1966 Census of Scotland.

The special study areas were all subjected, in Chapter II, to rigorous analysis in terms of absolute change since 1755. While it is thought unnecessary to repeat those findings here, certain specific comment would seem appropriate. Table V.1 shows the population totals for each area for the period 1755 to 1970. Although the rural parishes are arranged in alphabetical order, this also corresponds to an upland to lowland grouping. Thus the changing demographic pattern from the higher to the lower ground can be readily appreciated. The period of maximum population in the rural parishes occurs between 1831 and 1851 although both Lilliesleaf and Swinton maintain high totals to 1871. The contrast between this and the urban situation is revealed by the Hawick figures where the onset of rural decline is paralleled by extensive burgh increases; between 1851 and 1891, the date of Hawick's maximum population, the urban total almost trebles. During the present century, the rural areas reveal continuous but increasingly rapid decline to levels well below their original populations in 1755. The 1970 figures reveal that the population is leaving the rural areas in even greater numbers than before. On the other hand, the situation in Hawick has remained

relatively static, showing an overall decline of only 6% in the sixty-five-year period 1891 to 1966 — indeed the 1966 figure shows a slight increase over the 1961 total.[1] It would appear, therefore, that in respect of absolute change the specific trend, as illustrated by these special study areas, parallels the general pattern described in Chapter II.

Before leaving the topic of population distribution, however, it was felt that these special study parishes presented an opportunity for sample testing the accuracy of the dot distribution series of maps. In view of the time difference between the 1970 field survey and the 1961 dot maps, the information collected then could not provide an adequate basis upon which to institute such a test. Recourse was made, therefore, to the 1861 census enumeration returns which are now available to the general public in their original manuscript form. Using the addresses and enumeration totals from this source, it has been possible to construct a further dot distribution map for each parish and place the dots with the greatest accuracy that a 1 inch to 1 mile base map will allow. The results of this check test are shown in Figure 57. It will be readily apparent that there is a remarkable correspondence between the two sets of maps. Misplacement of dots does occur, but where over-representation is found it is usually compensated by under-representation at an adjacent nucleus — as, for

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1. According to the preliminary statistics of the Census of Scotland for 1971, this increase appears to have been maintained, since the enumerated population is given as 16,286 and the provisional resident population as 16,449.

example, at Simprim Farm and Simprim Mains Farm, Swinton, and at Bewlie Farm and Bewliehill Farm, Lilliesleaf. However, it should be pointed out that the element of guesswork involved in placing the dots on the original maps has given rise to the occasional error. Such is the case at Swinton House where the population is over-represented by ten persons, i.e. two dots. There, the manor house was reckoned to be occupied by ten persons when, in fact, presumably owing to the absence of the owners on census night, only one person was enumerated — a housekeeper. Perhaps the greatest test of these maps is provided by Ettrick, where the population is dispersed throughout the parish. Here, buildings were represented by dots on the original map when they were found, in reality, to be uninhabited on census night or occupied by only one or two persons. However, such discrepancies are infrequent and it is considered that these sample tests provide fair proof of the reliability of the original maps. It should be noted that the method adopted in constructing the original maps is far less time-consuming than that in the sample tests. Moreover, enumeration returns from the Registrar-General are available only up to and including 1861 whereas the former technique was applicable to each of seven time-periods.

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The proportions of the population in the young, adult and old age-groups are shown in Tables V.2, V.3 and V.4 respectively. Between 1861 and 1970 the special study areas repeat the pattern of

overall decline in the proportion of children and increase in the percentage of old people which was revealed by the county figures and discussed in Chapter III. However, several interesting divergences do occur and a distinct contrast is found between the wholly rural parish of Ettrick and those of Lilliesleaf and Swinton where village nuclei have developed. Throughout the period, the proportion of aged in Ettrick is considerably lower than in the other parishes and during the nineteenth century shows greater similarity to Hawick. Assuming that the low Hawick figures at this time result, as in Selkirk county, from the influx of young couples with families in response to the labour demands of the growing textile industry, other causal factors must be sought in the case of Ettrick. Furthermore, while the proportion of old people in Hawick increases fairly steadily throughout this century, the percentage in Ettrick has remained well below the Border County norm. It is unfortunate that no data are available at parish level for the period 1931 to 1961. As a result, it is impossible to ascertain the trends in this important period of change in the age structure. The field survey, however, provides invaluable information as to the current situation and, from this, it seems reasonable to infer that a very low percentage of old people has been characteristic of Ettrick throughout the period 1931 to 1961. It would appear, therefore, that the conclusion drawn in Chapter III — that out-migration in the Border Counties is selective of young adults — does not obtain in Ettrick. Indeed it seems likely,

in view of the relatively high proportion of children in 1970, that the older element is the migratory sector of the community. Some pointers as to the cause of this phenomenon can be found in the C.S.A. (1964, p. 301) where the problems of obtaining medical attention are described. These, together with the absence of public transport and the remote and dispersed nature of the settlement pattern which can lead to several weeks' isolation in winter, combine to present an untenable way of life for the less active. The field survey revealed that those aged 65 and over lived either with their family or close to the one shop-cum-post office in the parish. It seems likely, therefore, that this lack of social provision has resulted in a reduction in the proportion of aged, not only in recent times but also for the greater part of the past century. Although other parishes tend to have rather better social services, it seems probable that Ettrick represents an extreme example of a general trend in the age structure of upland areas.

In Lilliesleaf and Swinton, on the other hand, the percentage of elderly shows a marked similarity with the figures for the counties in which they lie (Tables III.3 and V.4), except in most recent times. The 1970 figures are considerably higher than the county averages and this may arise from two factors. First, it may be that these sample figures, albeit on a 90% basis, are biassed toward over-representation of the proportion of aged, since they were the section of the community most likely to be found at home during the

survey. Furthermore, it was found that the older people showed the greatest interest in the research project and were the most co-operative. It appears likely, therefore, that the enumeration includes all those aged 65 and over, and, by omitting only those in the younger age-groups, does not yield a true sample. A second factor which may help to account for this high proportion is the provision by local authorities of single-room housing units in both parishes. Furthermore, the small single-storey cottages which line the main streets of both villages provide eminently suitable housing for the retired, and are often occupied by the widows of farmers and of agricultural workers. The increase in the percentage aged 65 and over in Lilliesleaf between 1901 and 1911 (see Table V.4) may be accredited to the existence during that period of an old people's home, now derelict.

Apart from the most recent parish figures, the statistics shown in Table V.2 tend to corroborate the conclusions drawn in Chapter III. For example, the textile town of Hawick shows a remarkable correspondence with the county of Selkirk where, it was suggested, the large proportion of children in the nineteenth century and the low percentages in recent decades could be correlated with the changing situation in the textile industry. Of particular significance is the recurrence of a minimum figure in 1951, a time when other parts of Scotland were experiencing substantial increases. The Hawick figures would seem to provide further support, too, for the theory that the low

fertility rate in the Border Counties may be associated with the limitation of family size by reason of the employment opportunities available to married women. In the rural parishes, however, the 1970 survey shows divergent results. Again, it is unfortunate that the trend leading up to these figures cannot be ascertained, as this might have provided some insight into the curious discrepancy between Lilliesleaf and Swinton, parishes which are otherwise alike in many respects. In Swinton, the low proportion of children, 22.4%, may be expected from the more general conclusions regarding Berwick, drawn in Chapters III and IV, and also the associated high percentage of aged. The 26.7% figure for Lilliesleaf, however, is abnormal, being well above both Border County and national average. Moreover, it seems probable that this high figure is not the product of any recent increase but one which has been typical of the parish over the past fifty years, for the last available census figure — that for 1921 — was 31.3%. Possible explanations of this excessive proportion of children might be found in a larger family size, better educational facilities or a greater attraction in Lilliesleaf than in Swinton for couples with young families. When the average number of children per family with members aged 14 or under was calculated, the figures for Lilliesleaf and Swinton were found to be exactly the same — forty-two families containing a total of ninety children, i.e. an average family size of 2.1 children. Both parishes contain a primary school and both lie within easy reach of secondary school

facilities. These two factors having been eliminated, it would appear therefore that Lilliesleaf is more attractive to couples with children. Availability of housing does not appear to provide a satisfactory answer, since both parishes contain comparable numbers of local authority housing and uninhabited cottages both in the villages and tied to the farms. It is suggested that the cause may lie in wider employment opportunities in the surrounding area. Evidence of this may be seen in Table V.8 where employment outwith the parish is chiefly in neighbouring towns, whereas many of the daily commuters from Swinton travel to neighbouring rural parishes and those who do work in towns have a greater distance to travel. Furthermore, the field survey revealed that the majority of those employed outwith the parish of Swinton were female, whereas in Lilliesleaf the larger proportion of commuters were male. In Ettrick, the high proportion of children, approximating to the national average, would appear to be a function of the small percentage of aged rather than a greater absolute number of children.

The dependency ratio shown in Table V.5 provides a summary of the proportions given in Tables V.2, V.3 and V.4. The trend for the Border Counties as a whole, of increase to 1871, decrease to 1931, followed by further increase to the present time (see Chapter III), is paralleled by the special study areas. In spite of missing data, it seems reasonable to conclude from these special studies that the dependency ratio has continued to increase since 1961, but that this

is the result of increasing proportions of old people rather than increasing fertility.

The method of sex ratio analysis by parish in Chapter III provides a detailed account of change in the special study areas and need not be repeated here. The sex ratios at each decade are shown in Table V.6 and, for the most part, follow the general Border County trend. This gives a current pattern of low ratios where agriculture is the predominant source of employment, as in Ettrick and Swinton, higher ratios where greater diversity of employment is available as in Lilliesleaf, whilst the highest sex ratios occur where textiles form the mainstay of the economy as in Hawick.

Since statistics on occupation are not available at parish level, it is difficult to establish the patterns of change in occupational composition for the special study areas. However, information on employment was sought in the field survey (see Appendix B). In order to provide some degree of historical comparison, statistics were also obtained for 1861 by abstracting the relevant information from the parish enumeration returns of the Census of Scotland for that date. The occupations for both 1861 and 1970 were classified, as far as possible, in accordance with the system used for 1961 (see Appendix A), thereby providing figures which are directly comparable and removing one source of difficulty experienced in the occupation analysis in Chapter III. Unfortunately it was not possible to extend this part of the survey to Hawick since the breakdown of figures in

the special census survey of 1966 was not by occupational status but by socio-economic group. Nevertheless, the figures for the three parishes, shown in Table V.7, display certain revealing characteristics.

The deliberate selection of rural parishes has resulted in the largest percentage of the labour force being employed in agriculture. Whilst the absolute numbers engaged in farming have decreased considerably since 1861, as a proportion of the total labour force the decline is less remarkable, and indeed an increase is seen in Ettrick. Although the continuing importance of agriculture in the parish economy is in all cases immediately apparent, the equal proportions seen in the 1970 figures for Lilliesleaf and Swinton are less expected since there is considerable divergence from their respective county averages. In the case of Lilliesleaf, a percentage of 31.6, some 10% above the Roxburgh norm for 1951, is hardly surprising in view of the rural environment. However, the Swinton figure of 31.9%, some 10% below the Berwick average for 1951, would seem to indicate that Swinton may be atypical of rural Berwick. This comparatively low percentage would seem to result largely from the higher proportion of females employed both in personal service (14.5% in 1970 as against 9.1% in 1951 for Berwick) and in clerical work (7.2% as against 3.8%).

Apparently related to the agricultural economy are the proportions employed in personal service. In 1861, relatively large numbers were thus occupied in all three parishes. By 1970, however, although these figures have decreased significantly, the large

proportion in Swinton compared with Lilliesleaf, and more especially Ettrick, may be considered indicative of the relative affluence of the Merse farmer, since the majority of these women are employed in the large farmhouses either in Swinton or in neighbouring parishes. The category of other and unclassified consists of such occupations as construction workers, fencers, agricultural engineers and mole- and rabbit-catchers, employment also mainly associated with farming.

The numbers engaged in sales and commerce have remained virtually static over the hundred-year period, although the proportion of the work-force which they represent has more than doubled in all cases. Numbers in the professional category have altered little in Swinton but are much reduced in Ettrick. In Lilliesleaf, however, the large increase can be attributed not to any increased local opportunities, but to the possibility of commuting to nearby towns such as Galashiels, Selkirk, St. Boswells and Hawick. The decrease of employment in textiles is largely due to the changing basis of the industry from cottage-type to factory-organised in the intervening period. This change from home to factory-orientated industry has also led to the elimination of other manufacturing in the economy of all parishes with the disappearance of rural crafts (see Saville 1957, pp. 146-154). This chiefly male employer in 1861 has been replaced in the occupation table (Table V.7) by clerical work in 1970, a predominantly female occupation. From the evidence presented by Table V.7, it would appear therefore that rural depopulation between 1861 and 1970 has occurred

largely as a result of decreasing labour requirements both on the land and in the farmhouse and of the urban re-orientation of the skilled worker.

Place of work statistics (Table V.8) are available only for the three parishes in 1970. They have already been useful in indicating the differing nature of destinations of daily commuters in Lilliesleaf and Swinton. The figures would appear to indicate that employment within the parish decreases from upland to lowland. However, it seems unlikely that this is a true causal relationship and it appears more probable that this variation is a function of transport availability. In Ettrick, where there is no public transport, only one person lived beyond walking distance of his work. The commuters in Lilliesleaf were mainly car-owning professional workers or else textile workers for whom special transport was provided, and during the field survey several comments were made regarding the inadequacy of the local bus service. Swinton, lying athwart an 'A' class road, had no such problems and commuting by bus was comparatively easy. It is suggested that the factor of transport availability may also be reflected in the occupational composition.

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Data on migration in the rural parishes is based on birthplace statistics collected by questionnaire in 1970 and once again it has been possible to obtain comparable figures for 1861 by recourse to the census enumeration returns. However, since the data refer only

to residents of the special study areas, only patterns of in-migration can be examined. Table V.9 gives details of in-migration by birthplace to the study parishes for 1861 and 1970. Such figures as are available for Hawick from the Census of Scotland Special Area Report, 1966, are also included. The patterns of in-migration shown in Table V.9 provide an interesting study for they reveal that the more isolated parish of Ettrick had fewest natives resident in it in 1970, although the reverse was true in 1861. The 1970 survey showed that most of the Ettrick natives were young children whilst the male element was chiefly native to other parts of the Border Counties or of Dumfries. Wives, on the other hand, tended to have birthplaces further afield. In Lilliesleaf and Swinton in both periods and in Hawick in 1966, a much higher proportion of the residents were native to the Border Counties and this appears to reflect their central rather than peripheral location — witness the high proportions of Dumfries-born present in Ettrick in both 1861 and 1970. The percentage of in-migration from outwith Scotland has increased over the hundred-year period on a scale comparable to that of the counties as a whole (see Chapter IV), but it is somewhat curious to find a higher percentage of native Scots in Hawick than in the rural parishes, although this may result from the disparity in size of the absolute numbers involved. By far the greatest proportion of non-Scots, in all instances, came from England. In the case of Swinton in 1970, 66% of these were born in Northumberland, providing further support

for the conclusion drawn in Chapter IV that the bulk of migration between Berwick and England was a localised movement. The mid-nineteenth-century Irish in-migration is represented in both Lilliesleaf and Swinton in 1861 but Ireland has all but disappeared as a migrant source today. Of those born abroad, most were found to be children of Border Counties natives.

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This analysis of special study areas has helped to corroborate the conclusions drawn in previous chapters and has provided additional evidence for their validity. The results of this investigation may be summarised thus:-

(i) Depopulation is seen to be much more prevalent in the rural parishes than in the burgh of Hawick.

(ii) The series of dot distribution maps would appear to be largely accurate.

(iii) The overall age and sex patterns revealed at county level also obtain at parish level.

(iv) At specific points in time, the age structure of the parishes tends to reflect the degree of social provision.

(v) In rural communities, the nature of housing in the villages appears to attract the elderly, especially women. This provides a possible explanation for the Yetholm parish anomaly of high sex ratios (discussed but unresolved in Chapter III), where the presence of two villages exaggerates the phenomenon.

(vi) Further evidence is found for the conclusion that rural depopulation occurs predominantly among those employed in agriculture and personal service.

(vii) An indication of the strength of the contiguity factor is seen in the peripheral parish of Ettrick, although even here the overriding demographic unity of the Border Counties is demonstrated.

(viii) Additional evidence is seen in Swinton for the Ravenstein (1885) theory that the bulk of movement between Scotland and England takes place along the border.

CHAPTER VI

CONCLUSION

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CONCLUSION

The preceding chapters have analysed the determinants and consequences of depopulation in the Border Counties. Throughout this analysis, it has been found that the choice of methodological approach has been limited by unsatisfactory data. As a result, although the quantitative nature of population figures would appear to lend itself to the use of statistical techniques, in reality non-comparability and other inadequacies in the data largely precluded the extensive application of such an approach. It was originally anticipated that, given a large enough sample size and given questions seeking facts rather than opinions, the field work by questionnaire would provide a satisfactory and reliable source of statistics. However, the analysis in Chapter V has repeatedly shown that the quality of data thus derived falls somewhat short of this optimum. Thus, in spite of a sample size which, by any standards, must be regarded as exceptionally large, the resultant figures were suspected of bias and must, perforce, be treated with caution. The research worker must therefore rely heavily upon official sources for accurate statistical information. It is unfortunate that while such information is collected by the Registrar-General every ten years, it is published

in ever-decreasing detail, for although additional statistics can be obtained on request the prohibitive costs involved effectively render them unavailable to the individual.

While the use of statistical techniques can undoubtedly assist in analysing population data, their main contribution lies in the possibility of endowing interpretations, already made, with a greater degree of quantitative precision. There are, however, other techniques which provide equally useful aids to the intelligent interpretation of the facts. For example, the analysis of population distribution through the series of dot distribution maps has proved a valuable and accurate approach. It has permitted examination of detailed distribution patterns in the Border Counties at no fewer than seven significant points in time within the two-hundred-year period and it is suggested that this mapping technique provides an eminently suitable basis for population research and spatial analysis in other non-urbanised areas where historical trends are being studied. One further type of approach employed in this research has been that of viewing a single aspect of demographic change through a number of different channels. This method proved successful, for example, in the analysis of sex ratios in Chapter III. However, it is obvious that the method of approach must be tailored to the requirements of the specific research venture and to the nature of the information available. Thus the methodology adopted here, although appropriate to this analysis of the Border Counties, will not necessarily provide

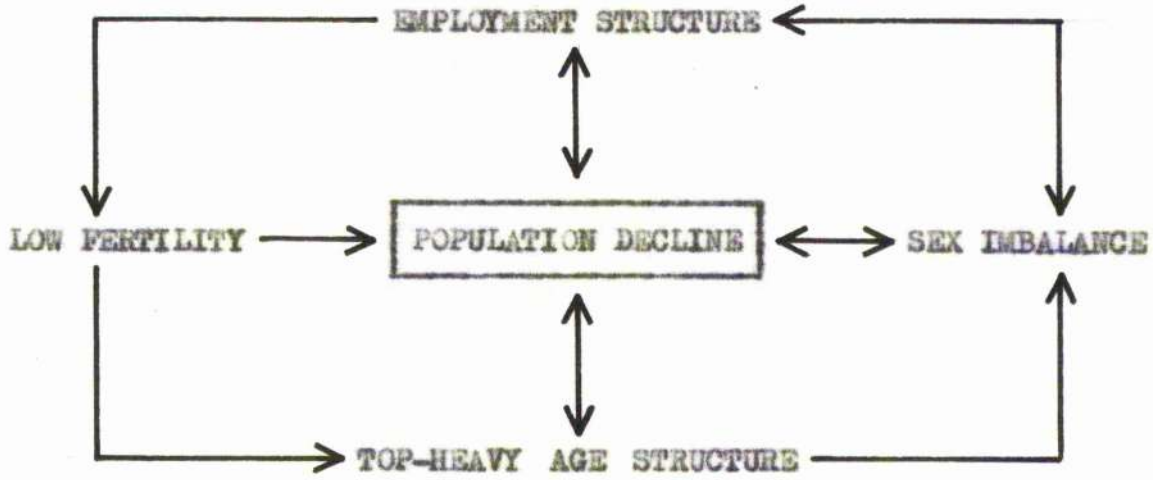
the most relevant approach in similar research elsewhere.

Specific demographic phenomena have been selected for detailed examination by a variety of complementary techniques. It is both difficult and dangerous to generalise in a brief summary the various facets of the problem which have been revealed by this research. However, the one causal factor which stands out as basic to the changes in the demographic trends is the economic structure.

The twin supports of the Borders economy throughout the period 1755 to 1961 have been agriculture and textiles. During the first hundred years, agriculture played the dominant role, and it has been seen that during this time population became more evenly dispersed with the increasing enclosure and improvement of land. Sex-ratios appeared to co-vary with intensity of cultivation and, with no substantial out-migration to this date, the age structure in 1861 showed a broad base, ensuring regeneration. During the middle of the nineteenth century, the textiles industry was re-organised on a factory basis while farming became increasingly mechanised. The resultant increase in employment opportunities in the towns and the decrease of labour requirements on the land led to a rural to urban migration. The migration study revealed that this flow was augmented by an in-migration from other parts of Scotland. Since this migration tended to be age-selective of young adults, the zones of textile development maintained a healthy age structure while the predominantly agricultural areas showed a decline in the reproductive cohorts. The pattern of sex ratios also changed with an increasing

excess of women associated with the textile industry while the wholly rural areas showed an increasing tendency toward male dominance. Prosperity in the textile industry was short-lived, however, and by the beginning of the twentieth century out-migration was prevalent in all parts of the Border Counties. The temporary arrest during World War I conbined with war loss to maintain high sex ratios in the early part of the century, but these have tended to decrease in recent decades. Meanwhile, in the rural areas, continued female out-migration has further lowered the sex ratios. Everywhere, the age structure has become increasingly top-heavy, especially so in Peebles where a small but significant inward movement is composed largely of retired migrants. The current pattern reveals a situation where reduction of employment opportunities in both textiles and agriculture has led to further out-migration. The resultant decline in population has been accelerated by imbalance in the sex structure, a top-heavy age structure and a very low fertility rate — all causal factors in current depopulation which, themselves, have been determined by previous economic and migration patterns. The inter-relationships of these factors may be shown schematically in the model below. (See overleaf.)

This investigation has attempted, therefore, to unravel the complexities of the inter-relationships among the various selected aspects of demographic change. These selected phenomena have proved to be simultaneously causal and resultant, determinant and



consequential, of the current depopulation in the Border Counties. However, research work rarely forms a complete entity in itself and suggestions have been made throughout the thesis as to possible topics for further study.

One of the most promising avenues for future research lies in the examination of the extremely low fertility rates in the Border Counties. The high percentage of married women in employment has already been suggested as a possible cause. It is significant to note that the ground report for the European Population Conference 1971 (reported in The Sunday Times, 29/8/71) expresses concern over this very problem. This report considers that the central factor for low fertility throughout Western Europe is the increasing number of wives who go out to work and suggests that the provision of day-nurseries could increase fertility by making it easier for mothers to take jobs. Evidence in the Border Counties, however, suggests that the solution may not be so simple. Here most of the textile

mills have, for some time, made just such provision and yet the fertility rate remains the lowest in Scotland. Nevertheless, low fertility is found not only in the textile areas but also in Berwick. The field survey of Swinton parish would seem to indicate that here too a relationship exists between low fertility and working wives, for one third of the total parish labour force is female. Obviously, research into this Border County phenomenon, an extreme example of a demographic problem common to much of Western Europe, would prove invaluable.

A second promising line of further investigation suggested by the current research lies in the re-assessment of Ravenstein's 1889 migration law of sex-selectivity. While it was found that the law of short-distance female movement and long-distance male migration was partially valid for the Border Counties in the nineteenth century, changing economic and social circumstance has resulted in a very different situation in the twentieth. Research into this phenomenon in other environments could well lead to the formulation of a law of sex-selective migration within which a typology could be established to make provision for such variables.

Continuing depopulation throughout the Border Counties reveals that textiles and agriculture alone cannot support the existing population without government intervention on behalf of a policy of economic expansion. The question of whether it is right to enforce economic viability in the area or adopt a laissez-faire attitude opens

up a whole new field of investigation which cannot be usefully pursued at this point. It is significant that two development plans for the area have been launched through government instigation, one by Sir Frank Mears in 1949 and a second by the Scottish Development Department in 1968. Both advocate a policy of expansion. Neither has been even partially implemented. Indeed, in spite of a plea by the Scottish Development Department for the retention of the rail link between Edinburgh and Carlisle, especially the section to Galashiels, the line was closed within a year of the report's publication. Government's habit of shelving the problem stems, perhaps, from the lack of a sense of urgency derived from the relatively low unemployment rate in the Border Counties. The Scotsman of 5/8/71 reported a rate of "only 3%, still well below the Scottish average". Such journalism gives rise to complacency by ignoring the underlying causes of low unemployment. For the Borderer, faced with redundancy, has proved to be a man of action, not prepared to sit and wait for better times but determined to actively seek opportunities elsewhere, since the prospects are far from encouraging at home. Such out-migration, while reducing unemployment in the Border Counties, only serves to aggravate the problem in other areas where unemployment is already rife. Planning proposals are not enough. The implementation of an integrated development plan at national level would appear essential. The Border Counties, calculated by the Scottish Development Department to have the economic potential to support a population two and a half

times its present size, could well play an important part in just such a redevelopment policy.

Meanwhile, as the Preliminary Report of the 1971 Census of Scotland reveals,[1] the population of the Border Counties continues to decline.

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1. The enumerated population of the Border Counties in 1971 was 97,235 as opposed to 100,828 in 1961, a decrease of 3,593 or 3% over the ten-year period.

APPENDICES

APPENDIX A

OCCUPATIONAL COMPOSITION

The following table shows the method of classification devised in Chapter III for the diagrams of occupations in 1921, 1951 and 1961. The first column indicates the category number used in the present analysis, the second gives the class number according to the International Standard Classification of Occupations (I.S.C.O.), the third describes the nature of each category, while the fourth column shows which Order numbers, as used in the Census of Scotland 1921, 1951 and 1961, have been allocated to each category. Note that although the end-product gives apparent intercensal correlation, the Order content varies from year to year, adding to the variations already inherent in the Census returns themselves.

CATEGORY	I.S.C.O. CLASS	TYPE OF OCCUPATION	CENSUS ORDER NUMBERS 1921	1951	1961
1	5	Agricultural, fishing and forestry	I & II	I & II	I
2	8	Textile and Clothing	XII & XIII	VII & IX	X & XI
3	8	Manufacturing other than Textile	VII,XIV,XV, XVII	IV,VI,X,XI, XIV	IV,V,VI,VII, VIII,XII
4	1	Professional, Technical and Related	XXV	XIX	XXV
5	3	Clerical	XXVIII	XXIII	XXI
6	4	Sales and Commercial	XXIII	XVIII	XXII
7	7	Transport and Communication	XXII	XVII	XIX
8	9	Personal Service	XXVII	XXII	XXIII
9	10	Other and not classifiable	III,IV,V,VI, VIII,IX,X, XI,XVI,XVIII, XIX,XX,XXI, XXIV,XXVI, XXIX,XXX, XXXI	III,V,VIII, XII,XIII,XV, XVI,XX,XXI, XXIV,XXV, XXVI,XXVII	II,III,IX, XIII,XIV,XV, XVI,XVII, XVIII,XX, XXIV,XXVI, XXVII
10	-	Economically inactive	XXXII	XXVIII	-

APPENDIX B

FIELD SURVEY QUESTIONNAIRE

1. FULL POSTAL ADDRESS .....

2. TOTAL NUMBER OF PERSONS IN HOUSEHOLD .....

3. NUMBER OF PERSONS IN HOUSEHOLD AGED 65 OR OVER .....

4. NUMBER OF PERSONS IN HOUSEHOLD AGED 14 OR UNDER .....

5. PLACE OF BIRTH: i.e. the mother's usual residence at time of birth (Please state number of persons in each case.)

   ETTRICK, LILLIESLEAF, SWINTON PARISH .....

   BERWICKSHIRE ..... PEEBLESSHIRE .....

   ROXBURGHSHIRE ..... SELKIRKSHIRE .....

   (excluding those listed under parish above)

   OTHER COUNTY IN SCOTLAND (Please name.) .....

   .....

   ELSEWHERE (Please name.) .....

   .....

6. OCCUPATION AND PLACE OF WORK OF EACH MEMBER OF HOUSEHOLD AGED 15 OR OVER

Males		Females	
Occupation	Place of work (name of town or parish)	Occupation	Place of work (name of town or parish)

Thank you for your co-operation.

Eve. M. Soulsby

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Eve. M. Soulsby

AN ANALYSIS OF SELECTED ASPECTS OF DEMOGRAPHIC CHANGE IN THE BORDER COUNTIES OF SCOTLAND 1755-1961

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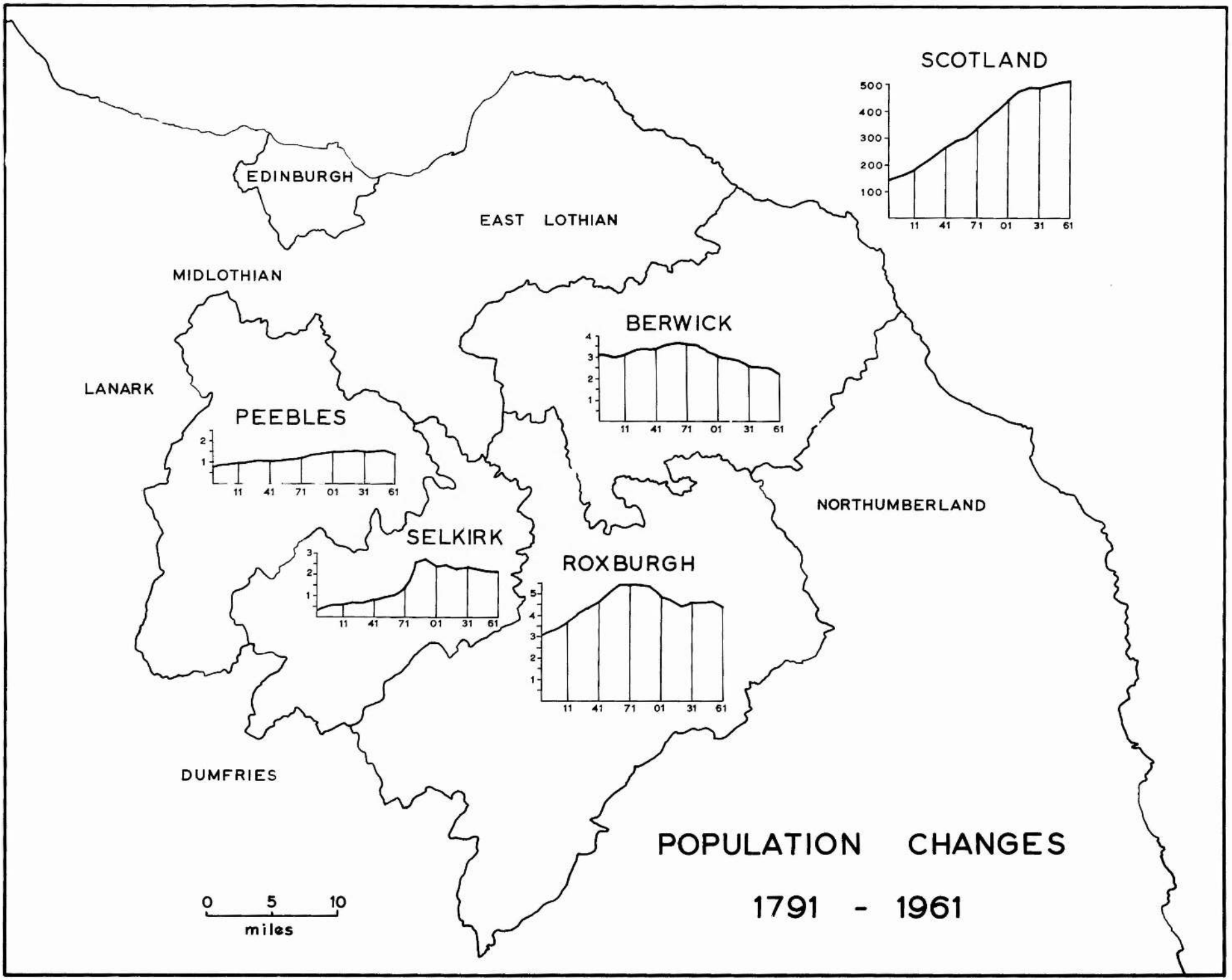
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LANARK
PEEBLES
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SELKIRK
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miles
POPULATION CHANGES
1791 - 1961


THE PARISHES
OF THE BORDER COUNTIES
Cockburnspath
Coldingham
Eye mouth
Abbey St. Bathans
Cranshaws
Ayton
Bunkle and Preston
Mordington
Longformacus
Duns
Chirnside
Foulden
Channelkirk
Lauder
Langton
Edrom
Hutton
Whitsome
Polwarth
Westruther
Fogo
Ladykirk
Greenlaw
Swinton
Legerwood
Gordon
Eccles
Coldstream
Hume
Melrose
Earlston
Nenthorn
Stichill
Ednam
Smailholm
Kelso
Sprouston
Galashiels
Mortoun
Makerstoun
St Boswells
Maxton
Roxburgh
Linton
Yetholm
Bowden
Eckford
Crailing
Morebattle
Ancrum
Lilliesleaf
Minto
Jedburgh
Bedrule
Oxnam
Hownam
Ashkirk
Hawick
Roberton
Cavers
Hobkirk
Southdean
Teviothead
Castleton
Tweedsmuir
Ettrick
Kirkhope
Yarrow
Selkirk
Caddonfoot
Traquair
Innerleithen
Peebles
Manor
Lyne
Stobo
Skirling
Broughton
Glenholm and Kilbucho
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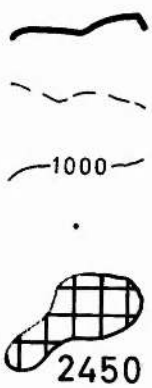
KEY TO ALL DOT DISTRIBUTION MAPS



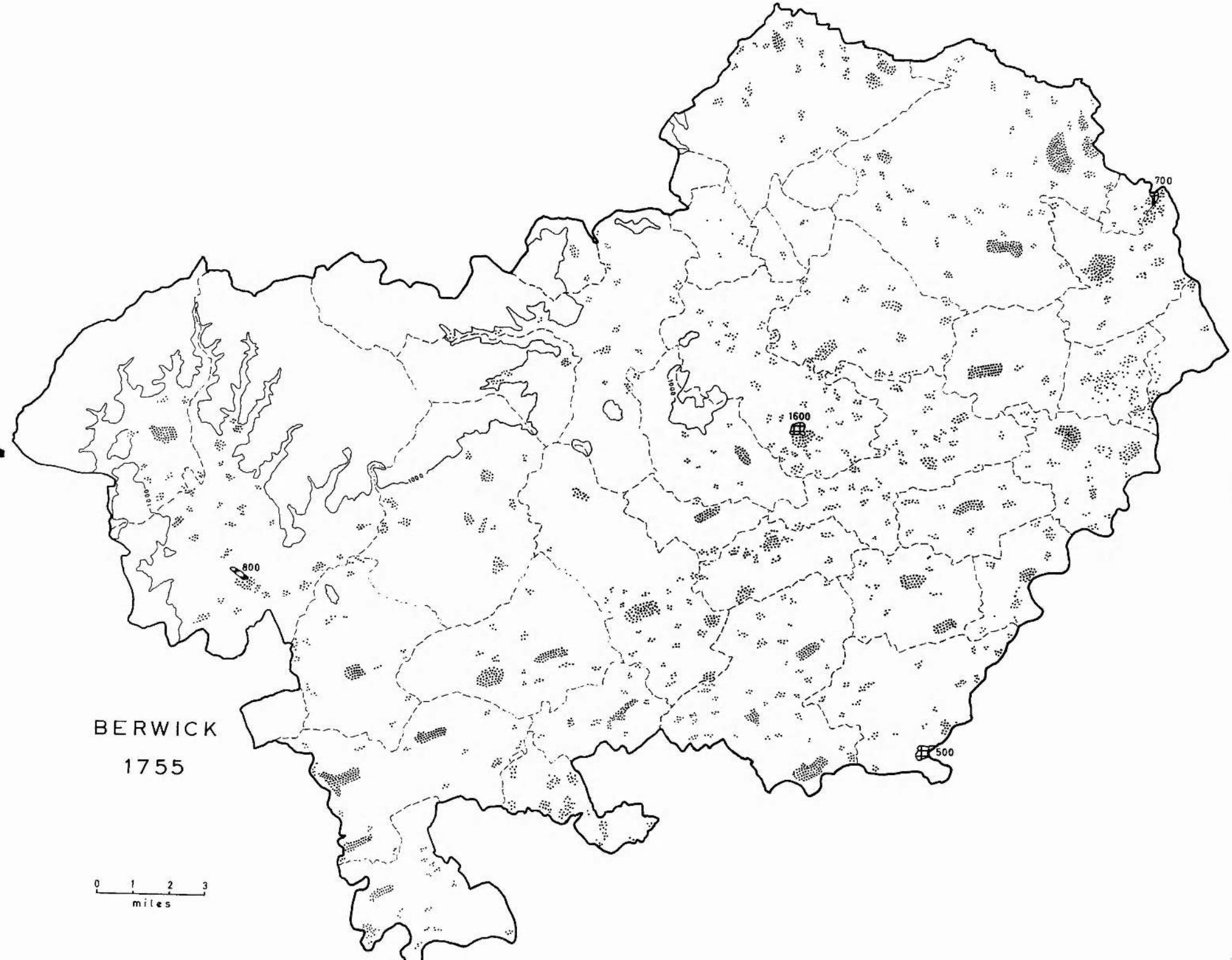
County Boundary

Parish Boundary

1000' Contour

5 Persons

Built-up Area of Given Population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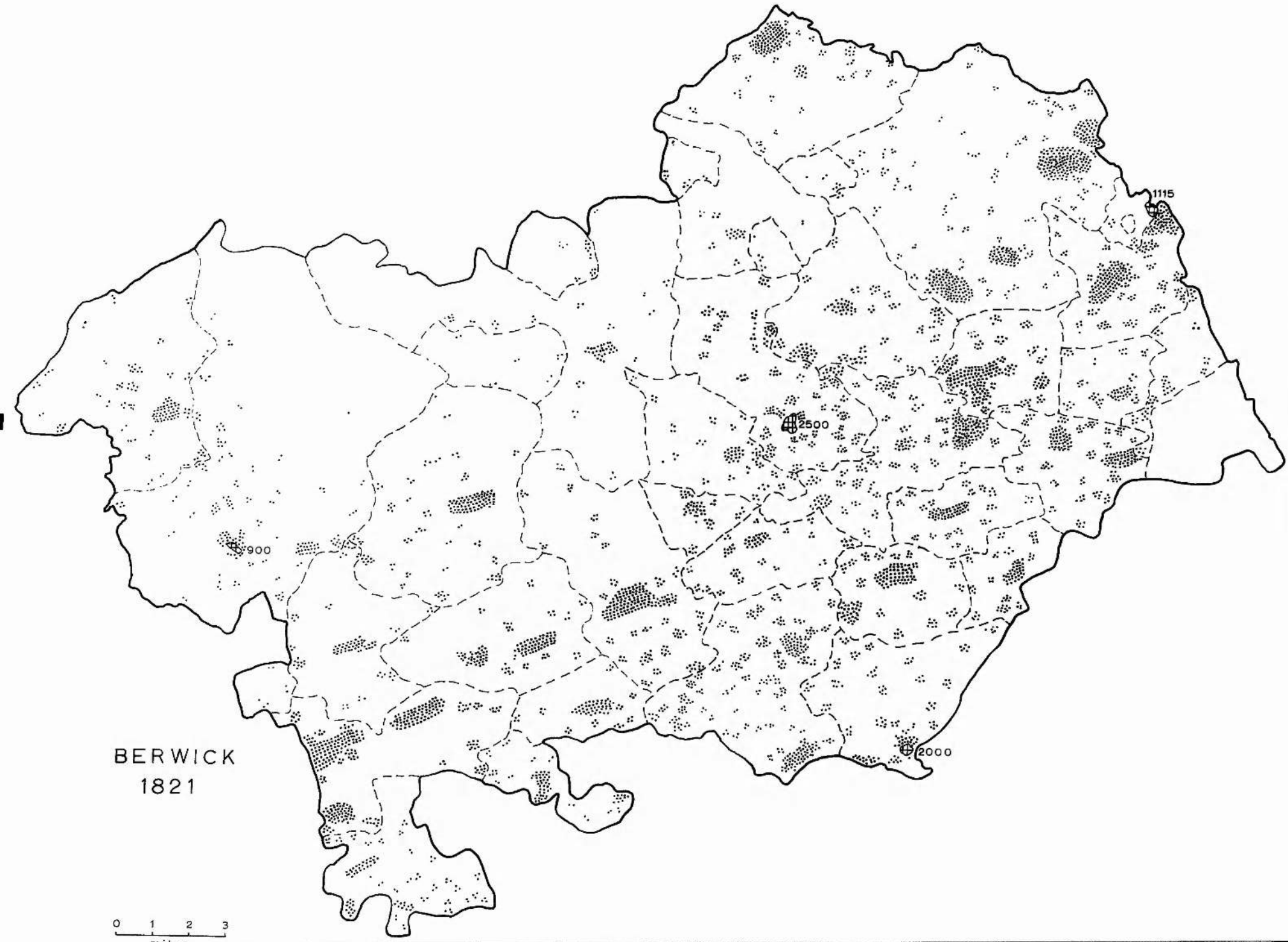
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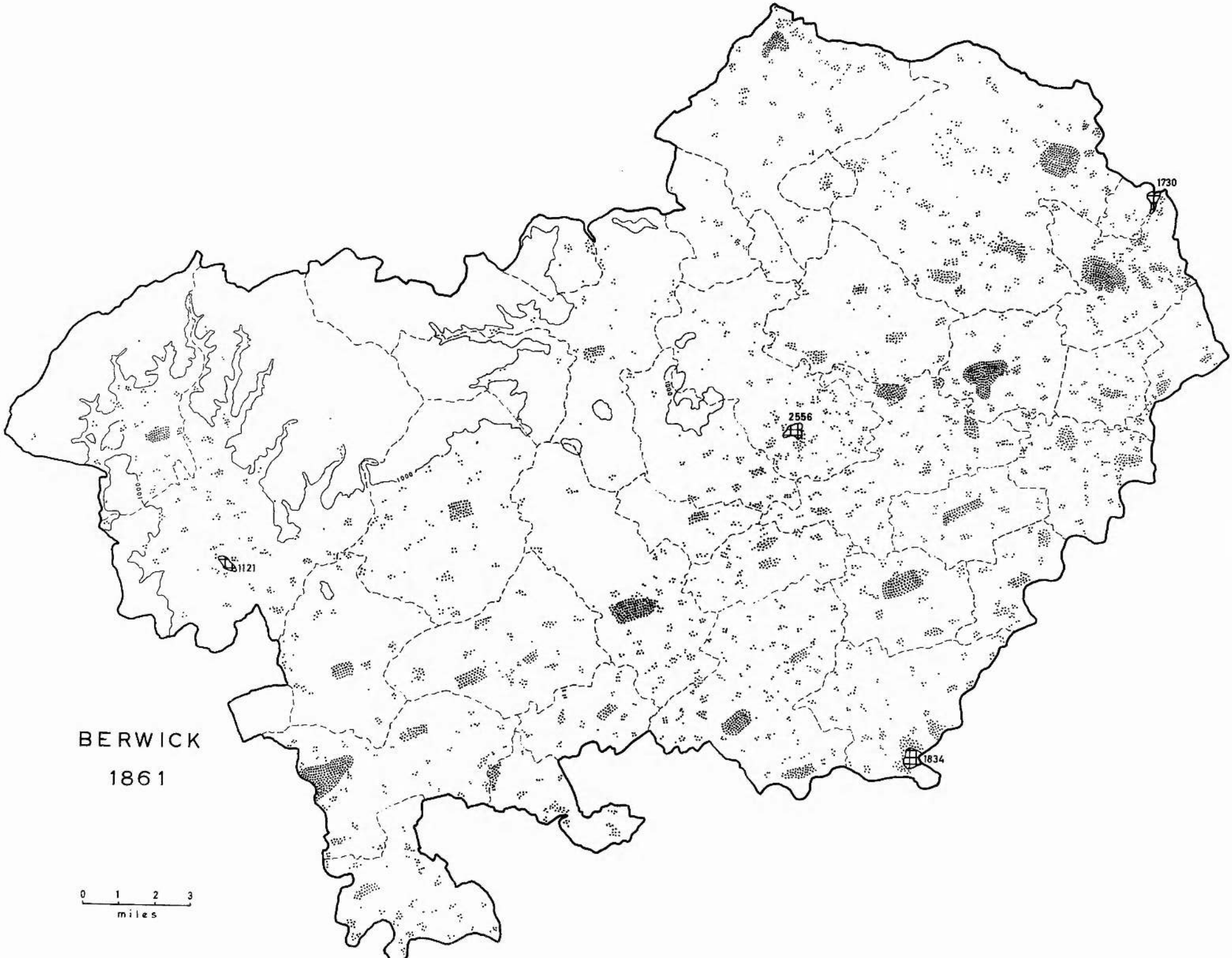
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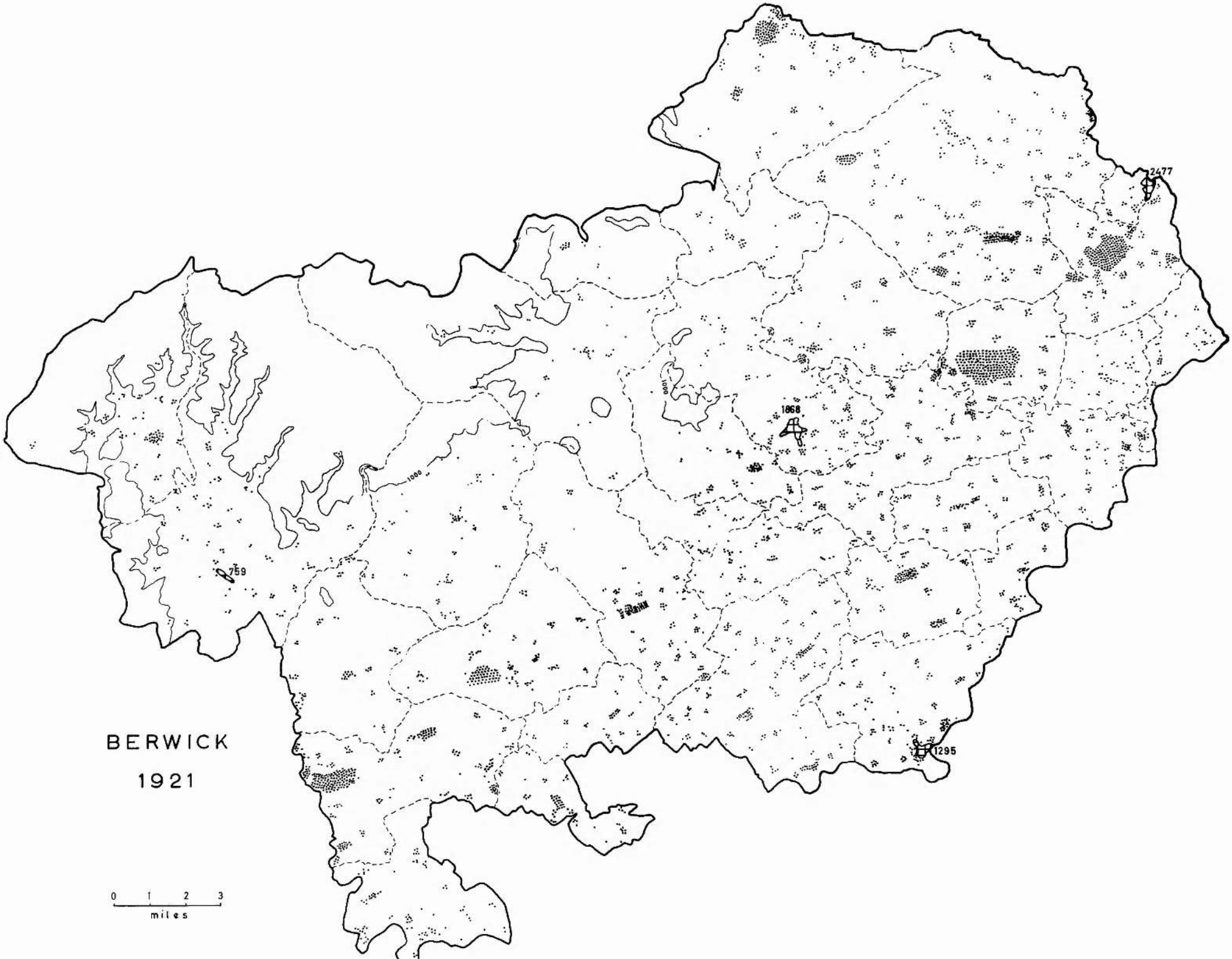
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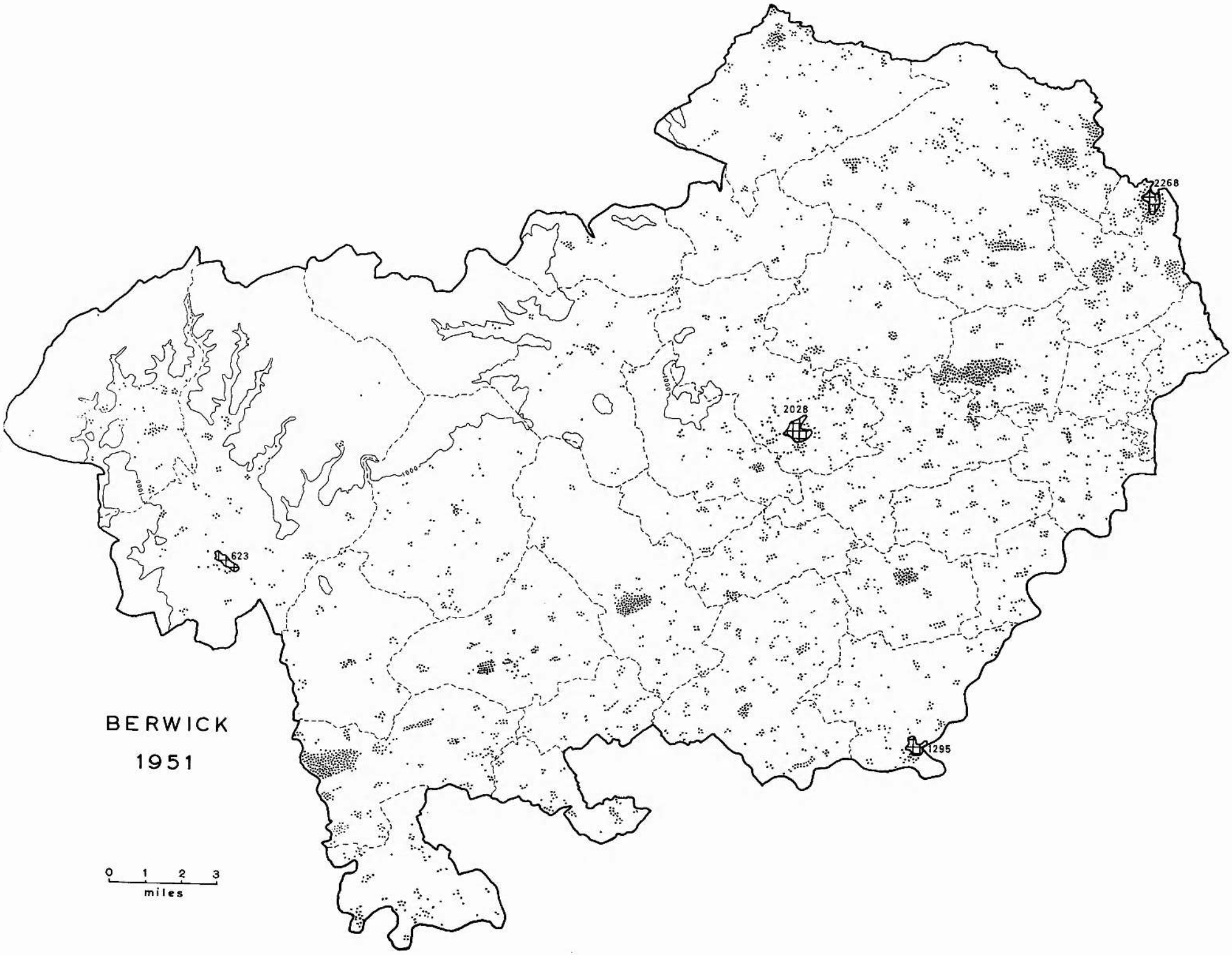
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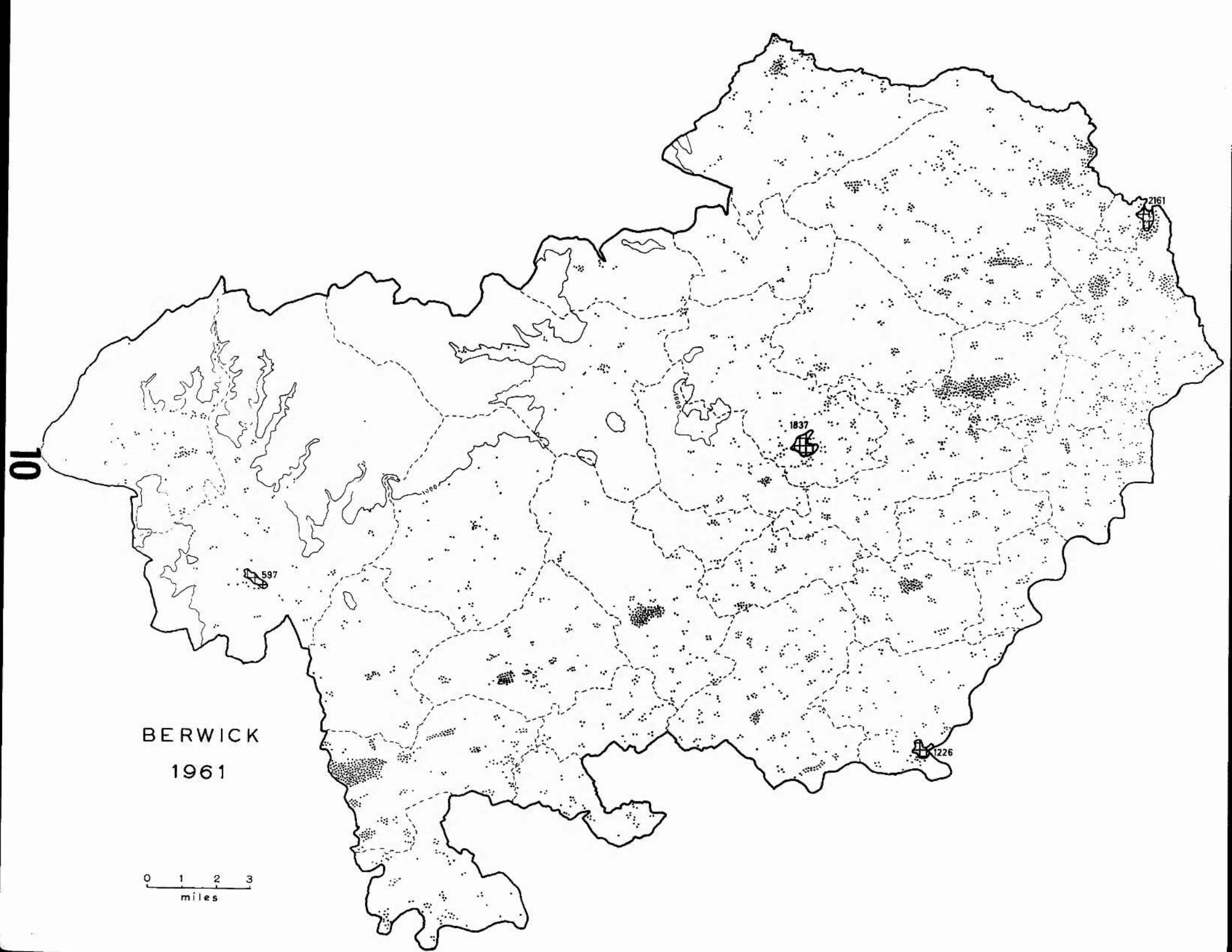
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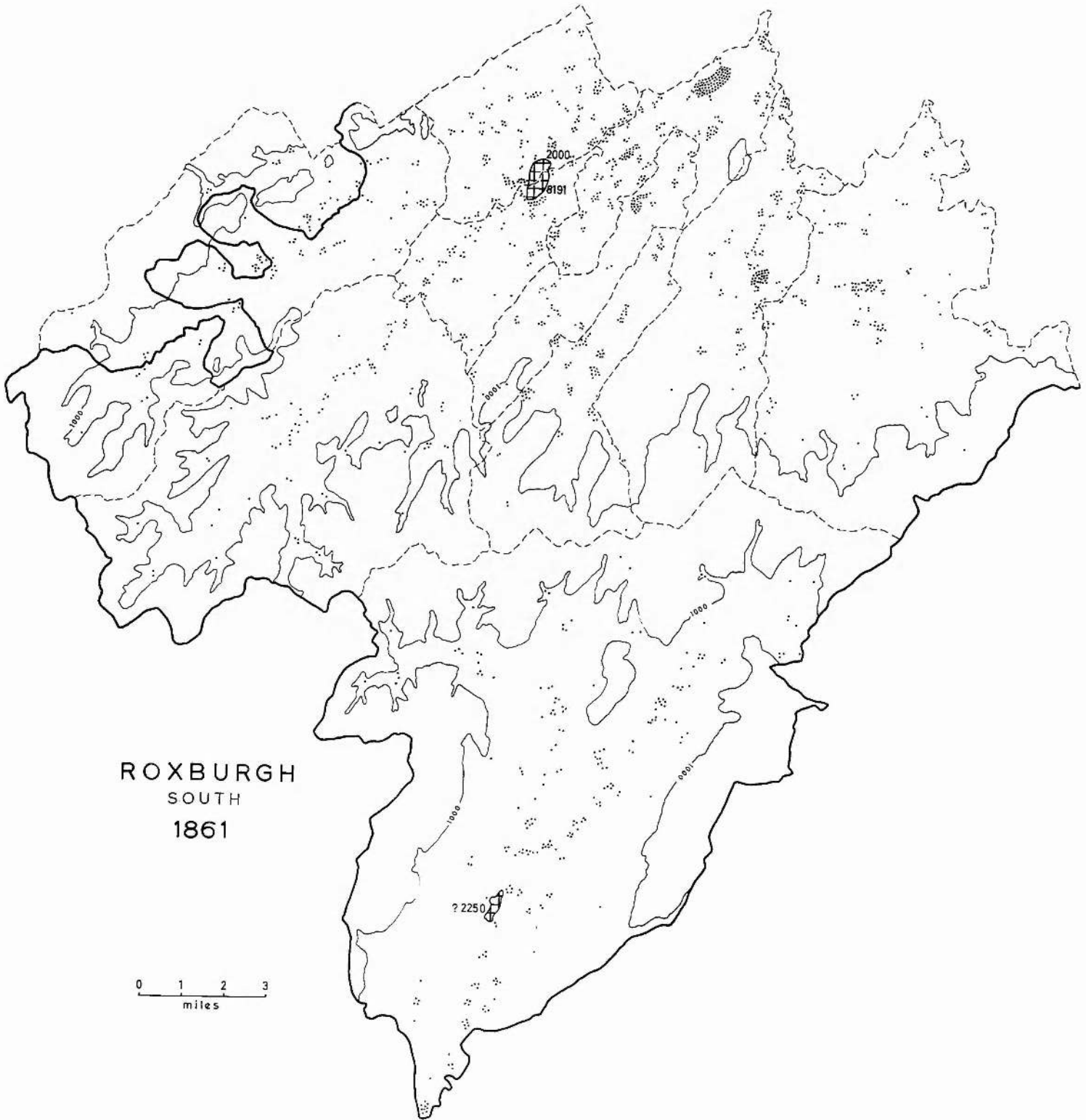
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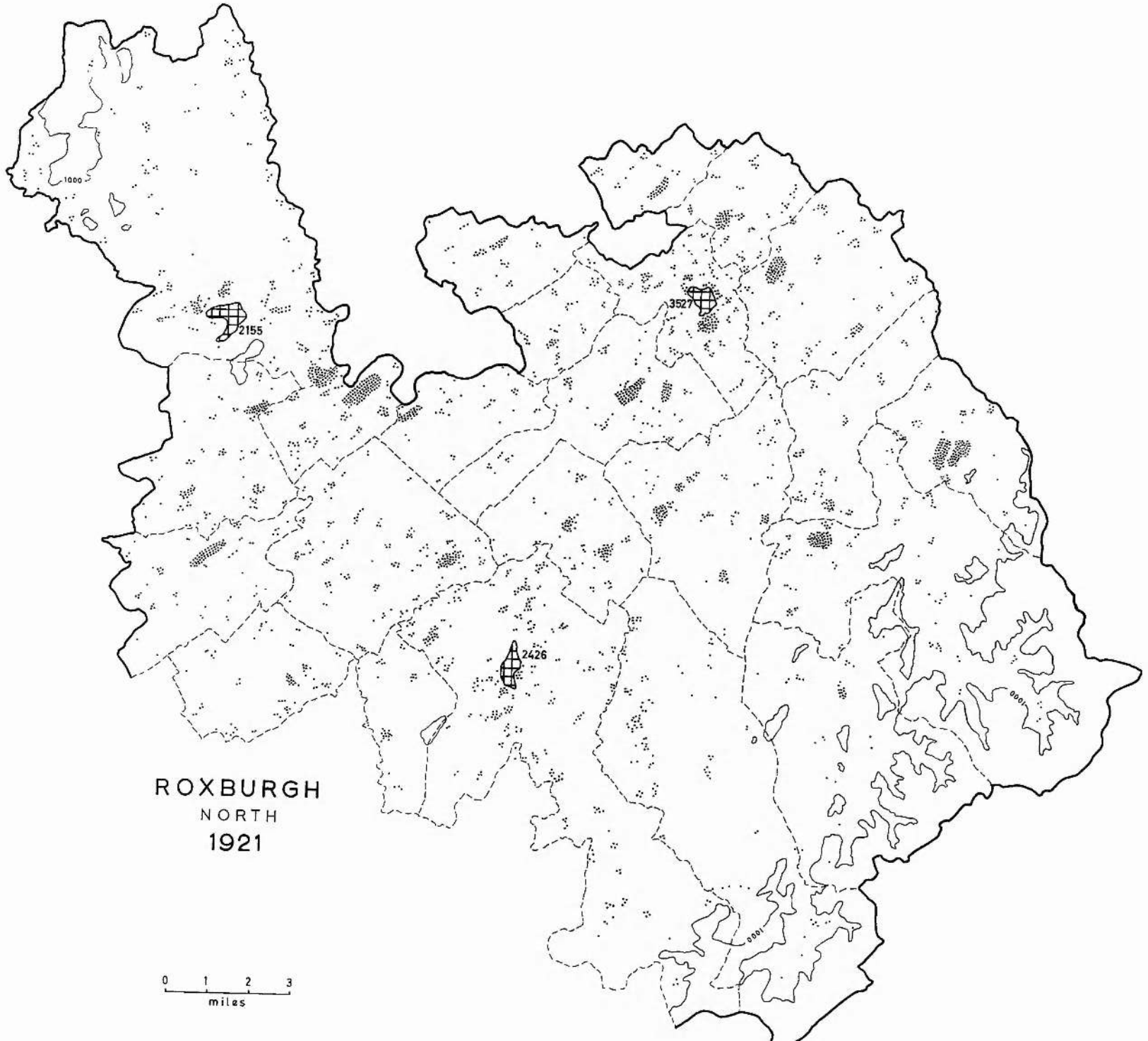
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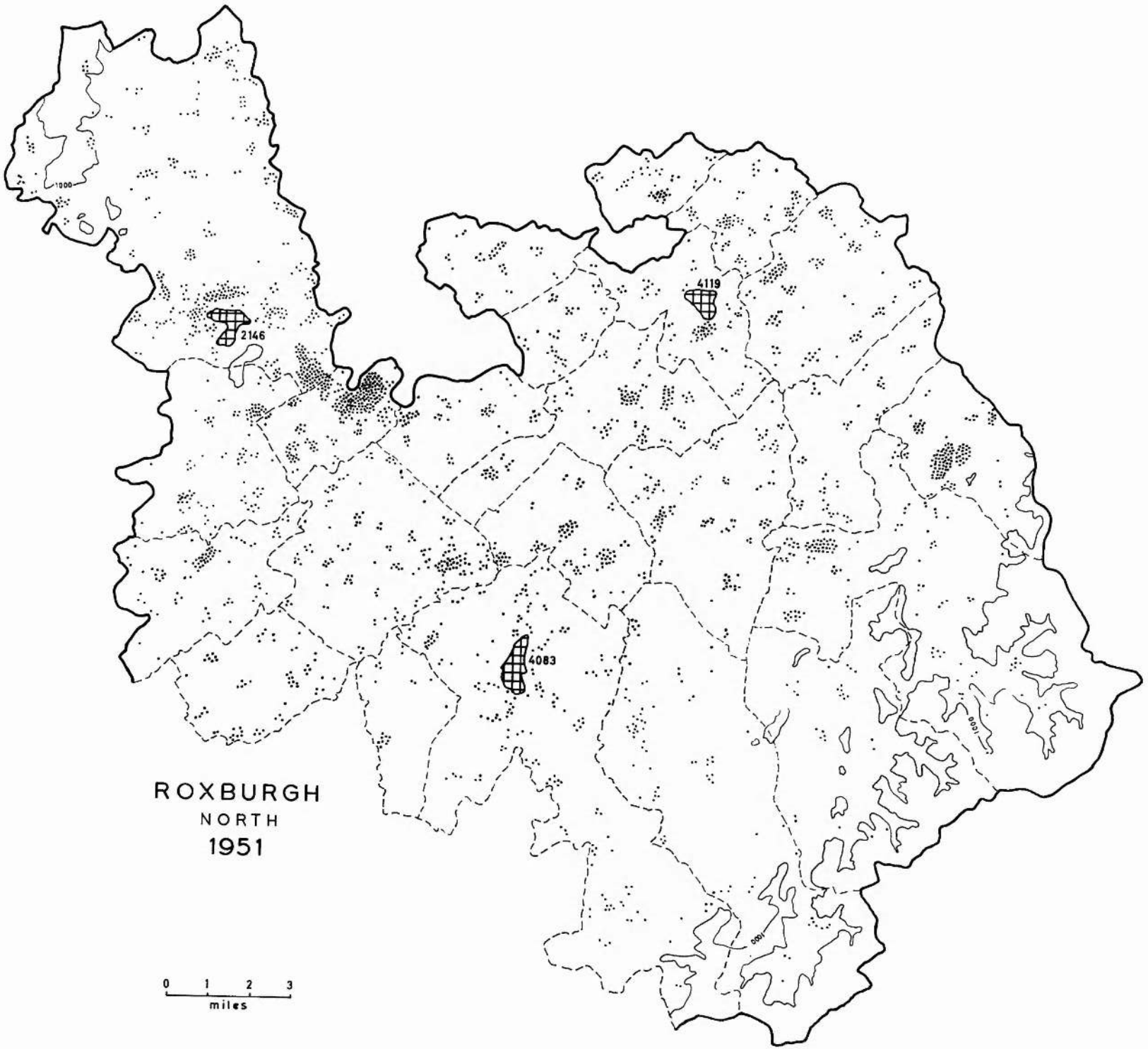
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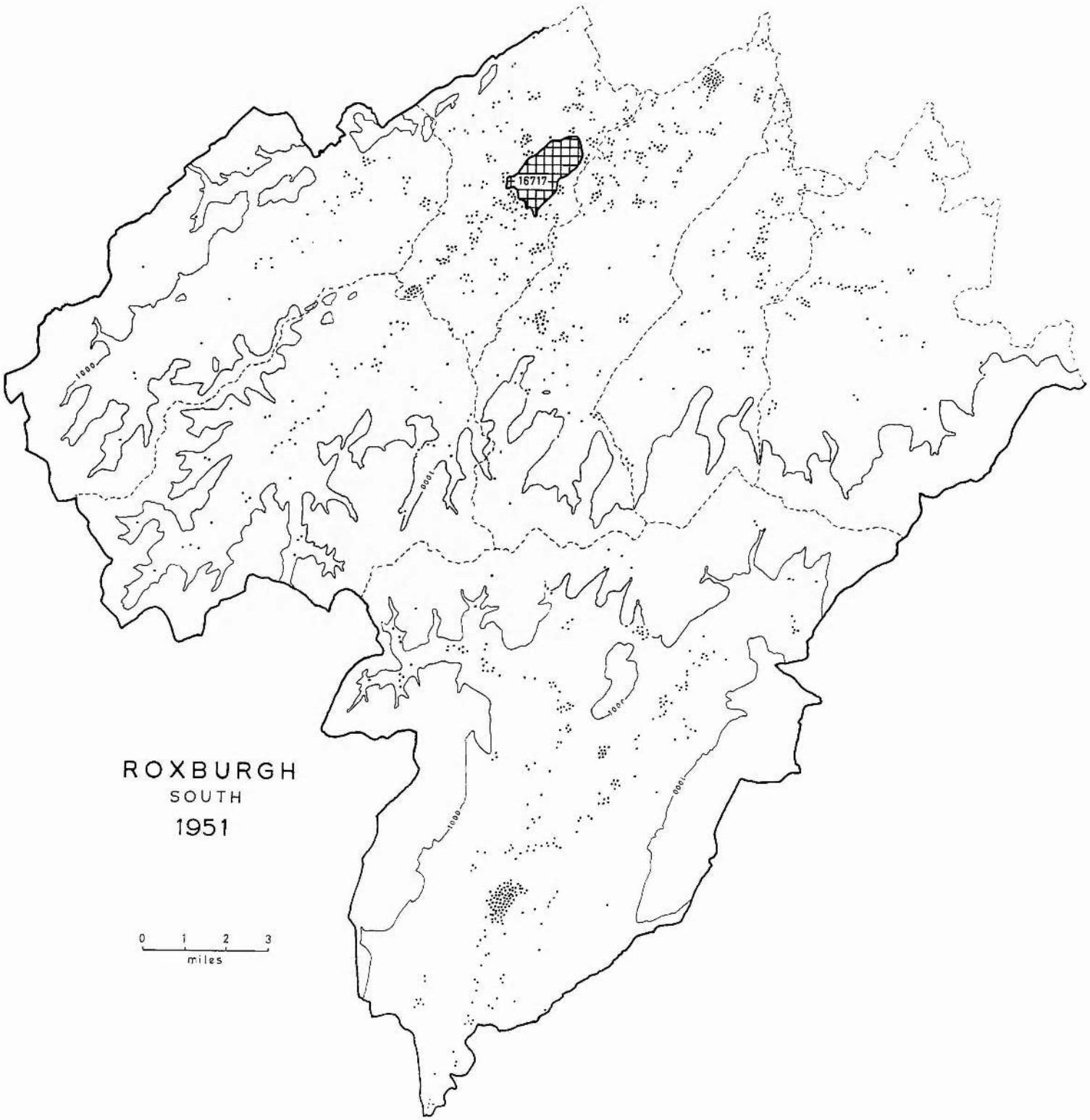
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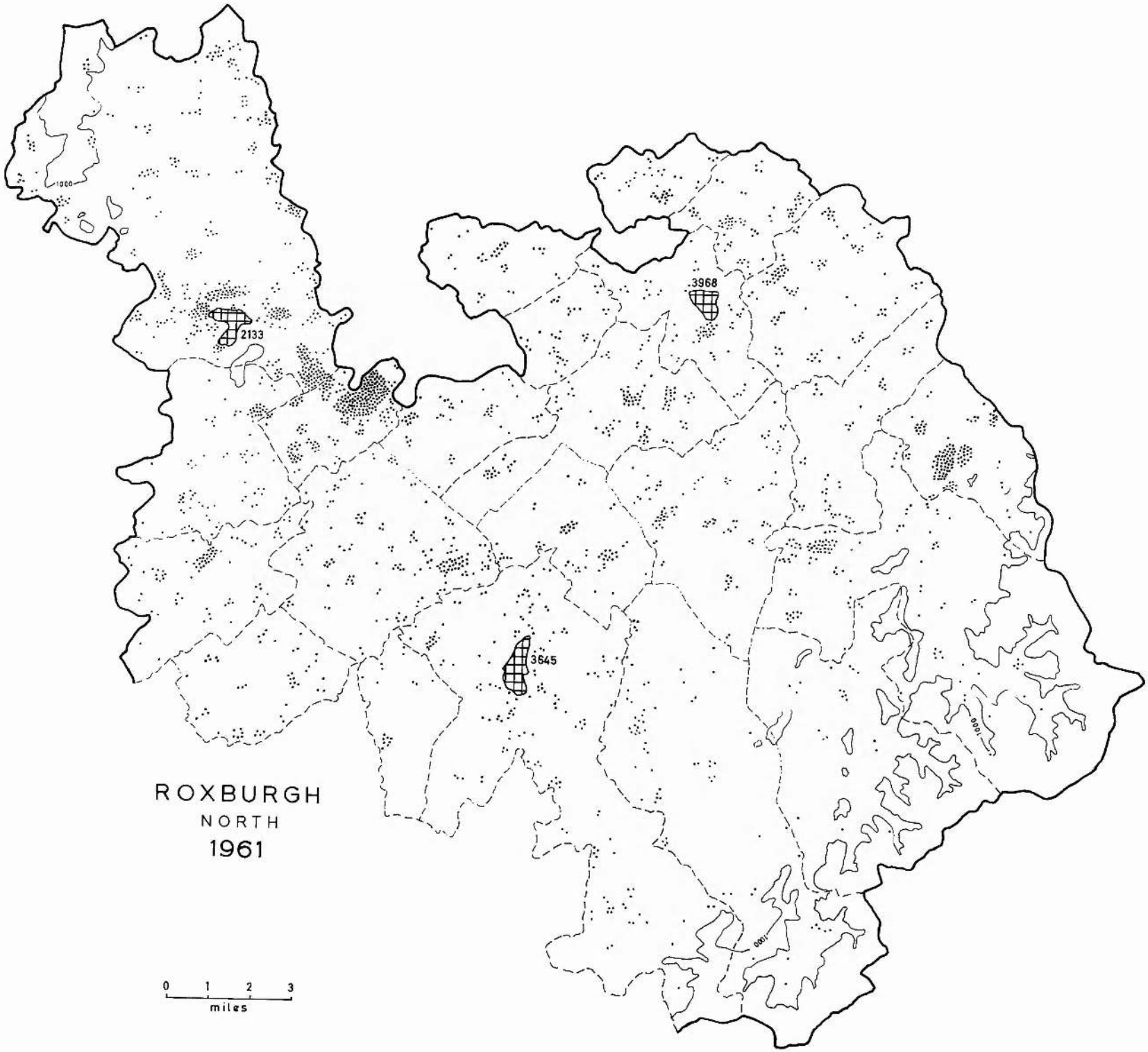
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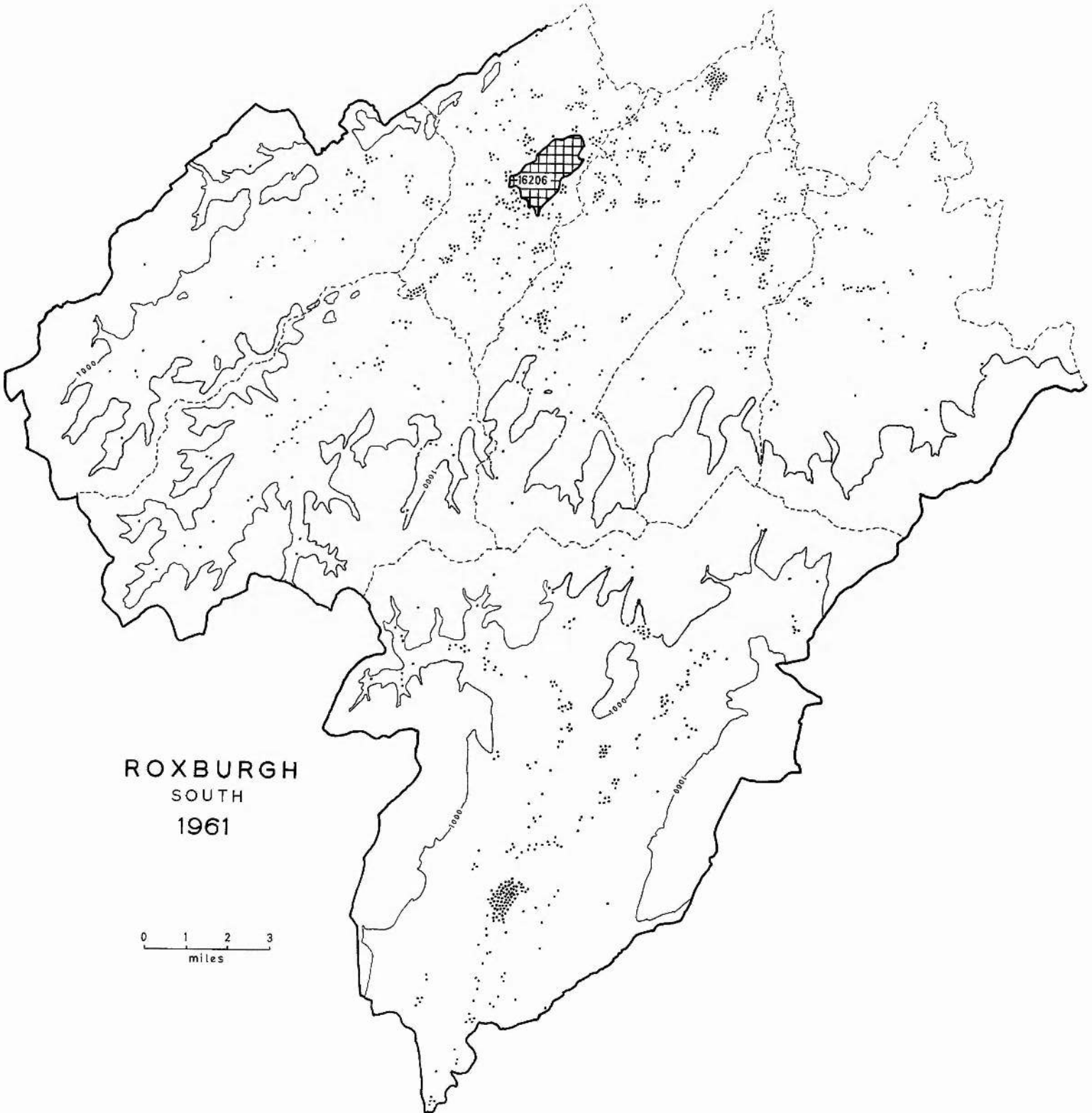
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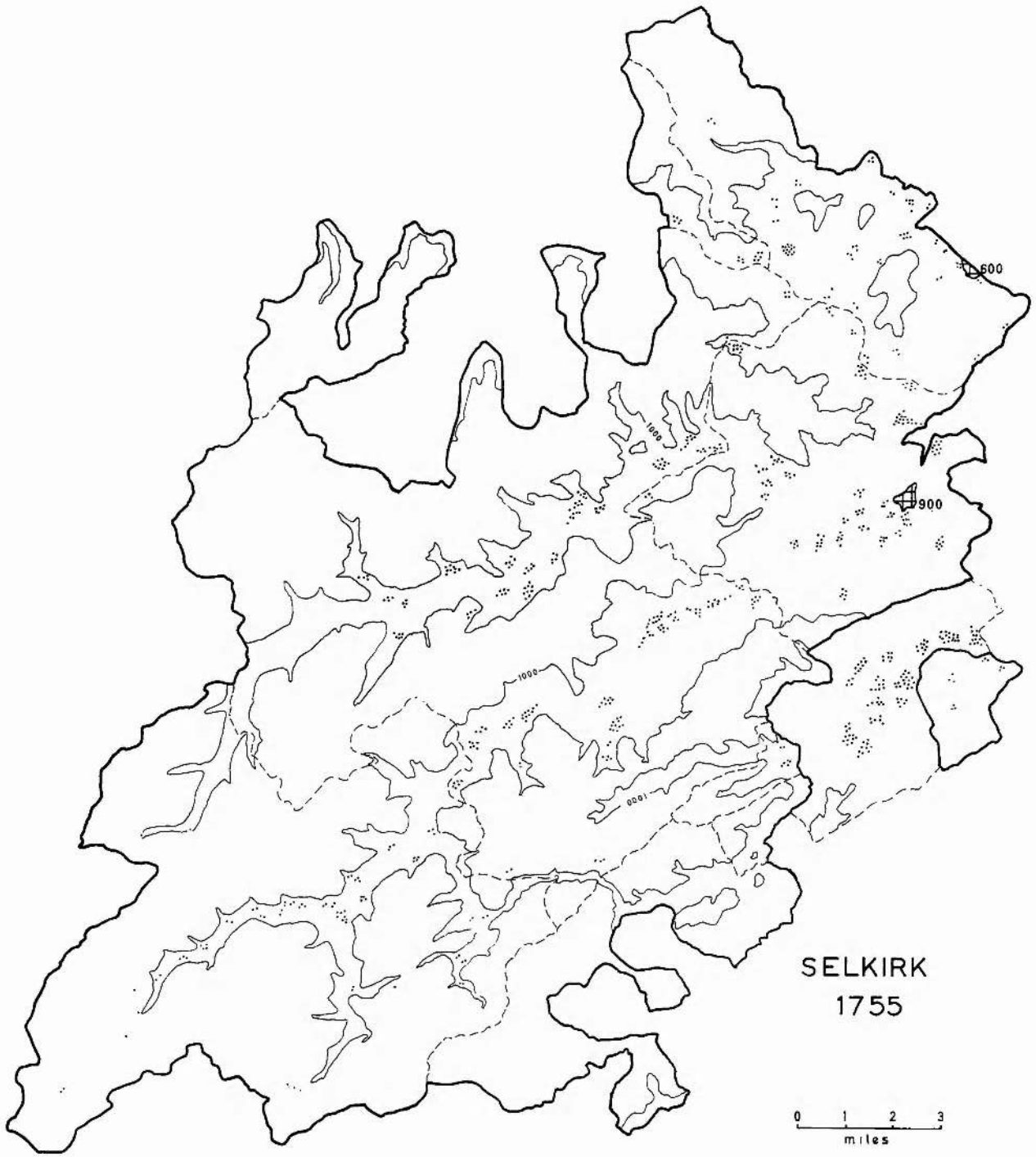
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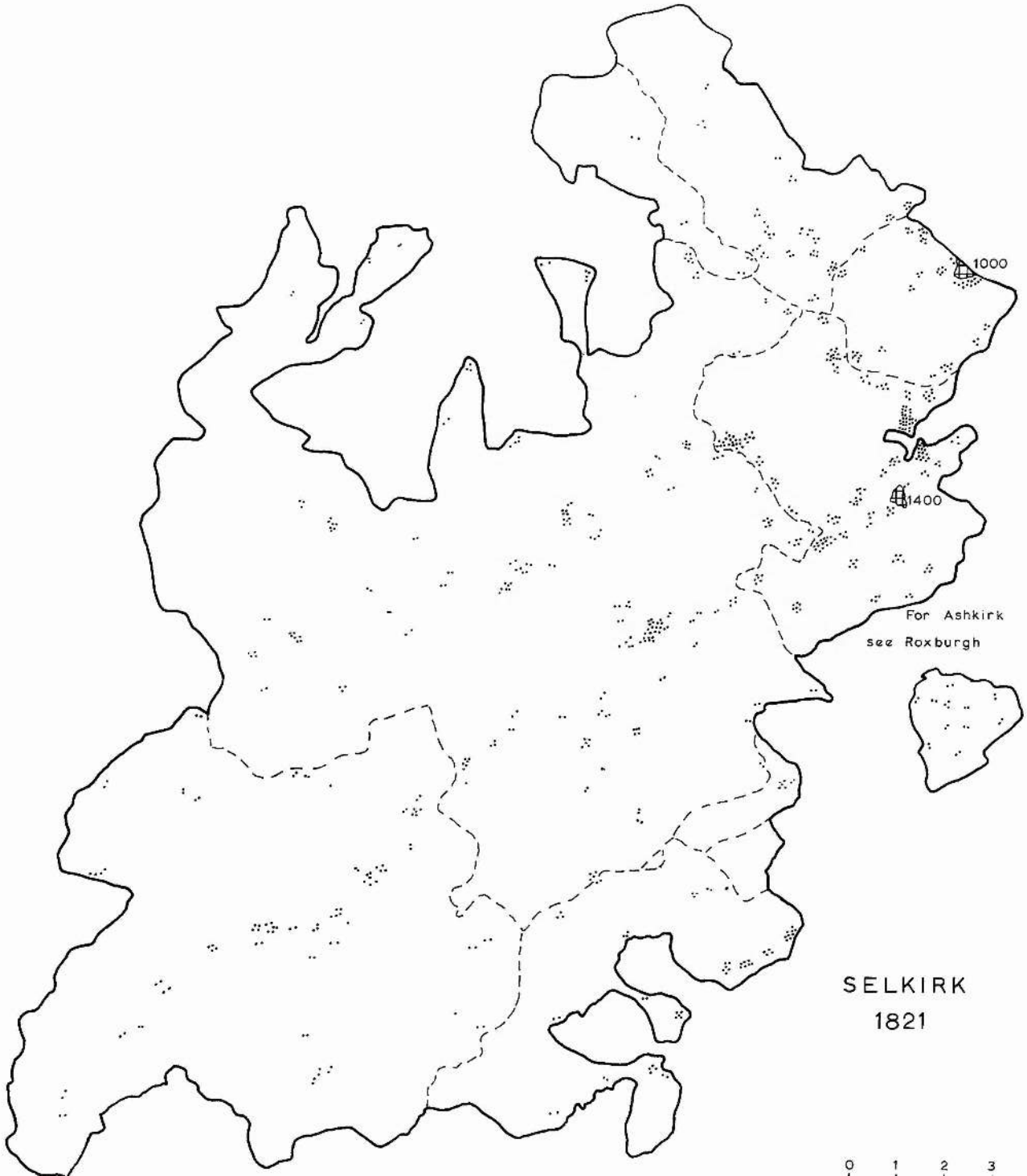
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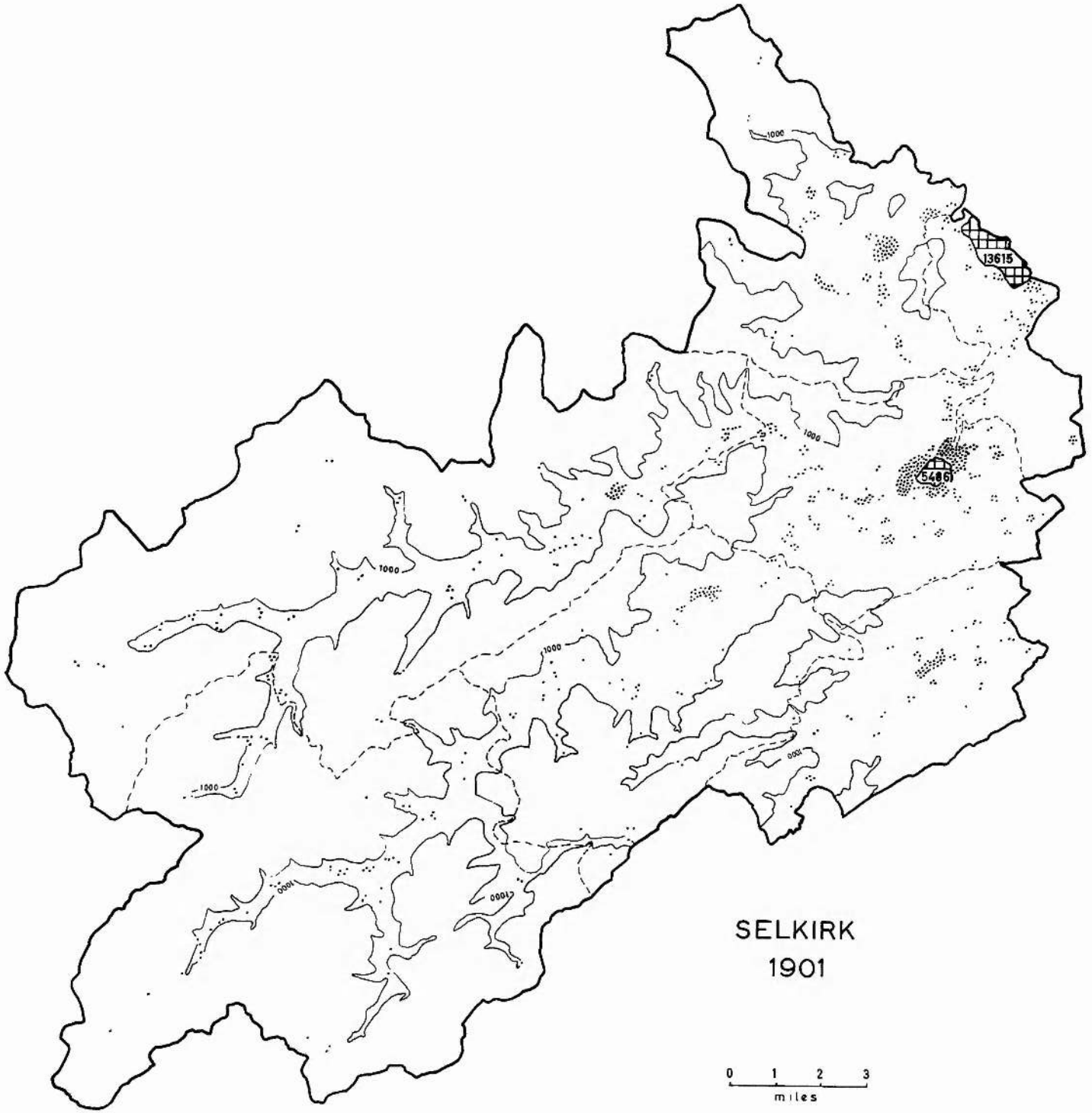
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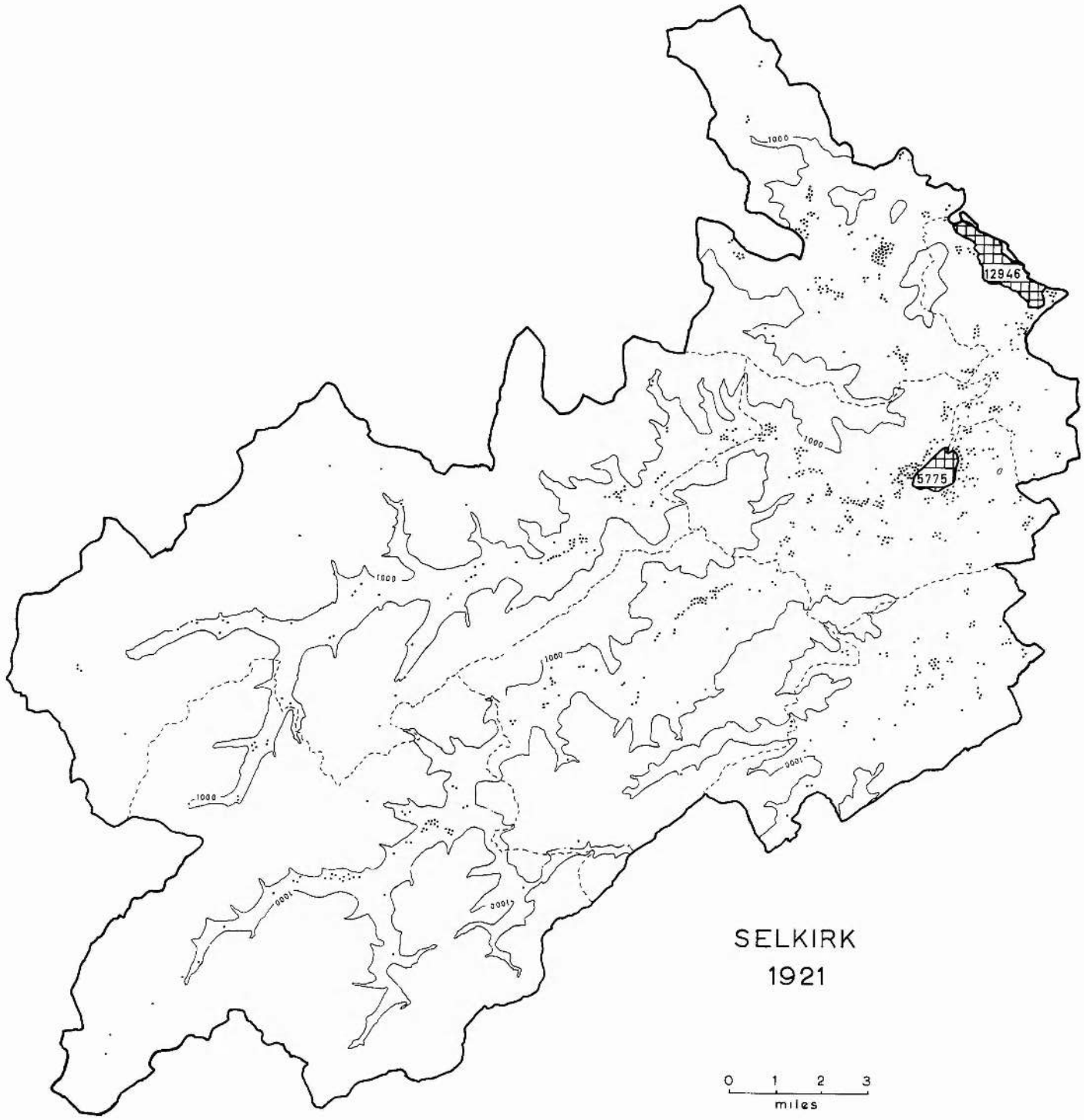
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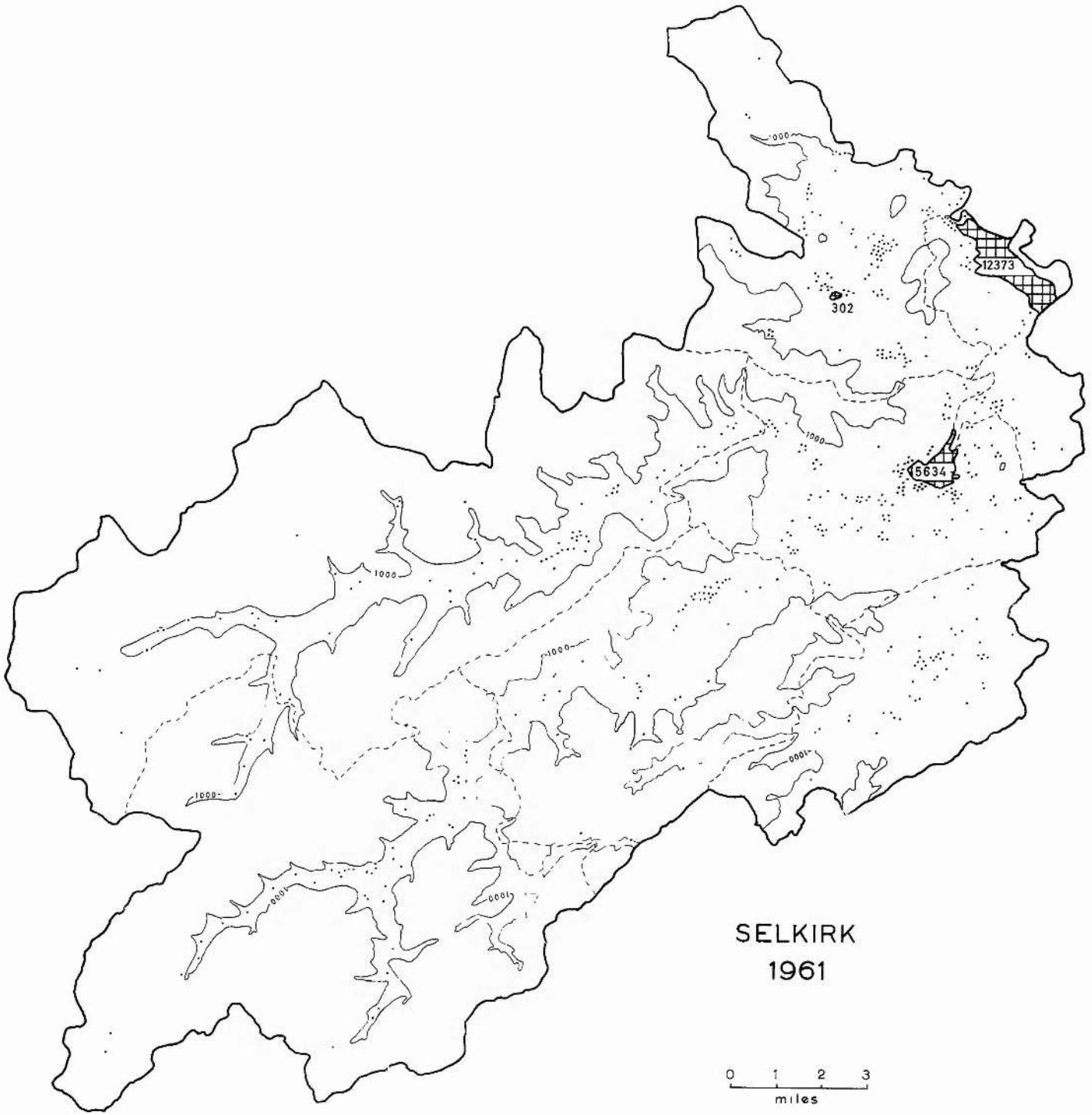
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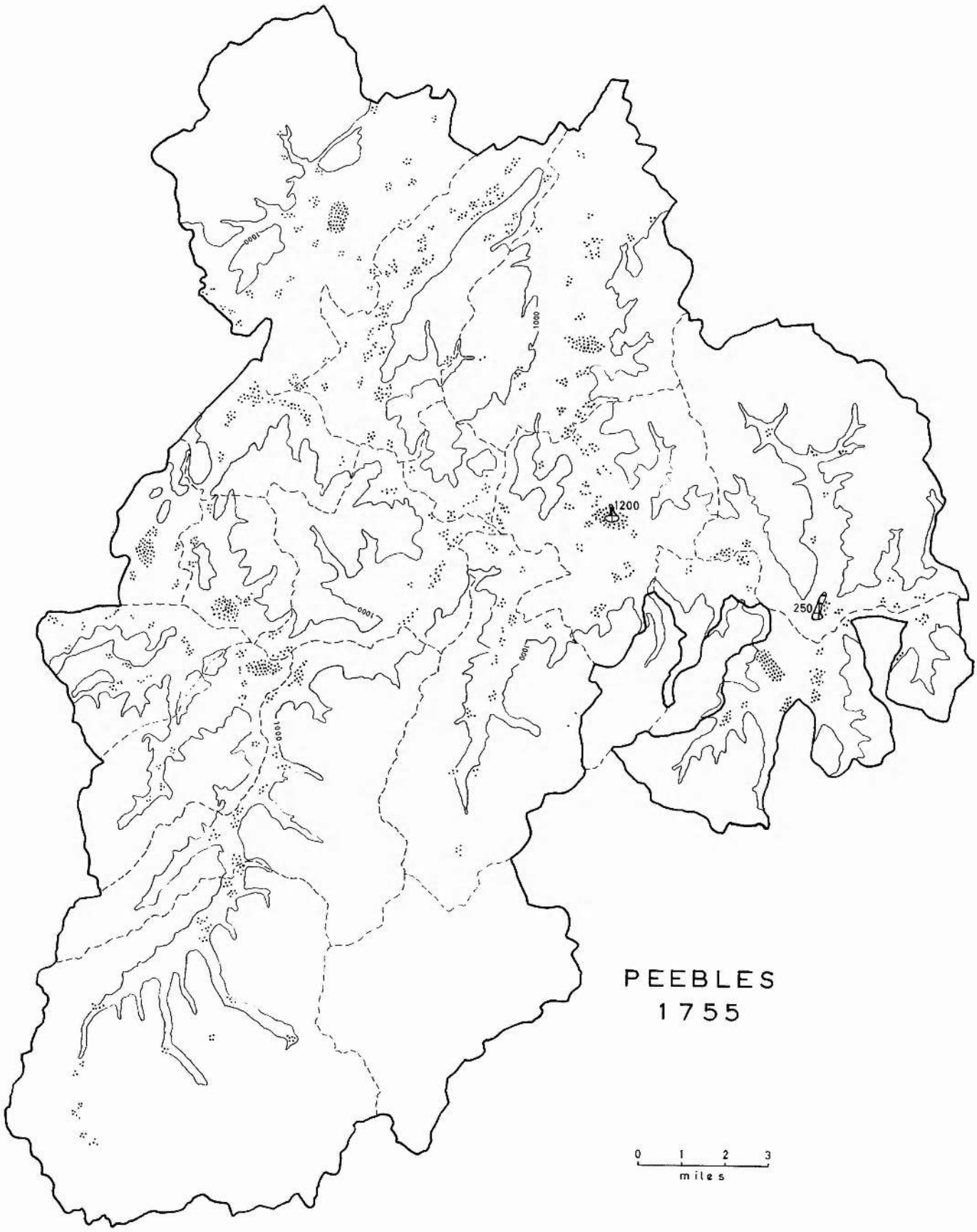
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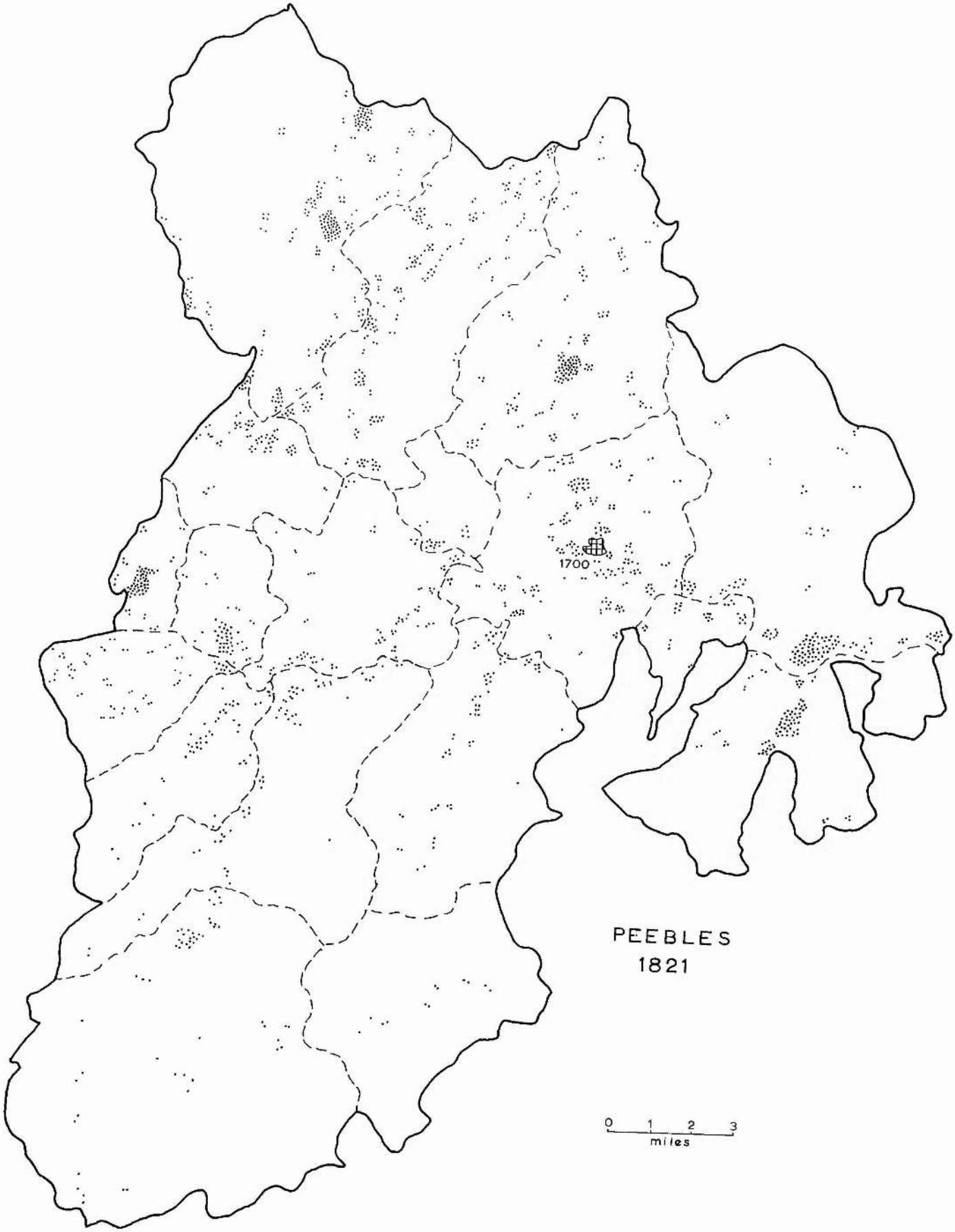
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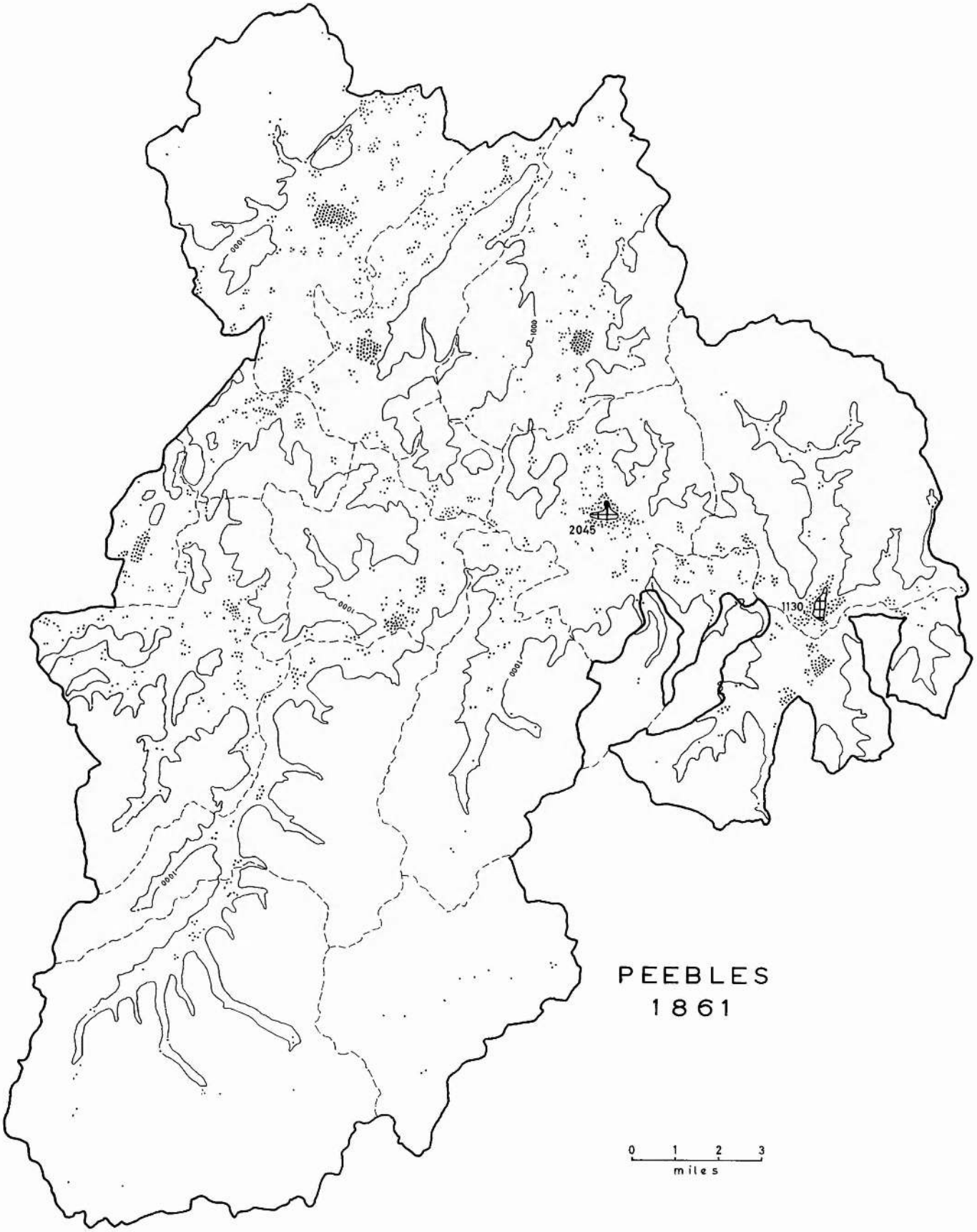
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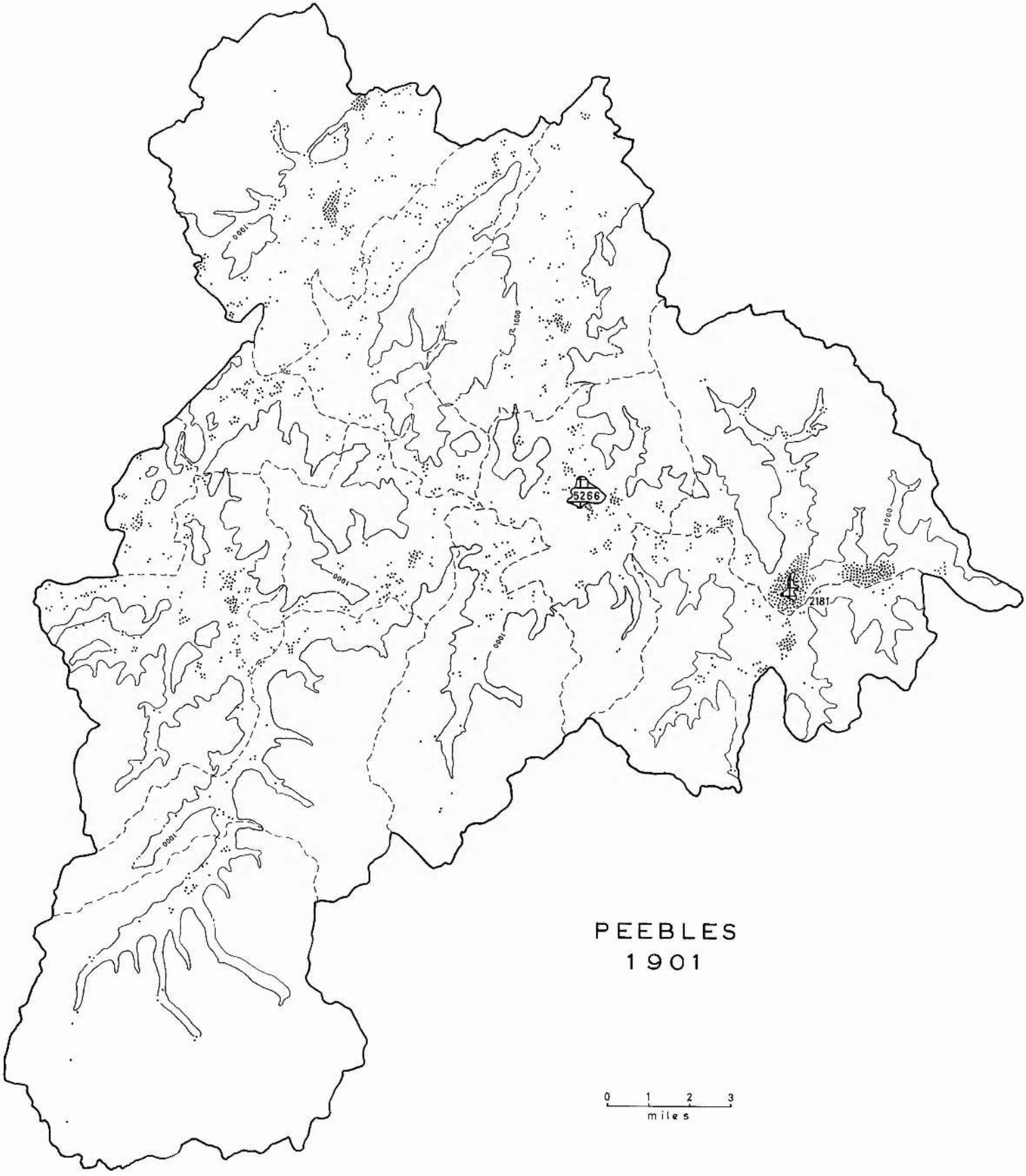
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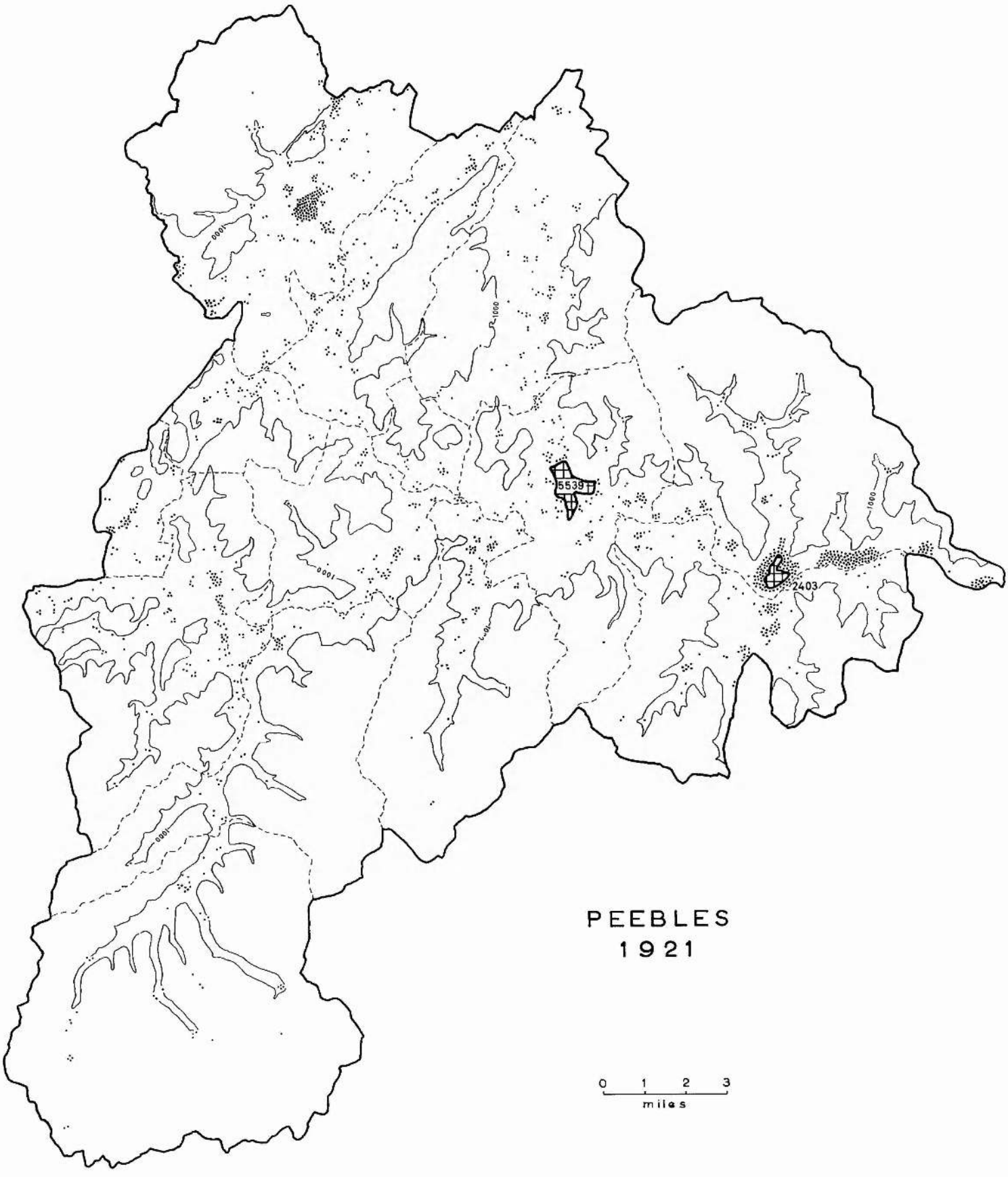
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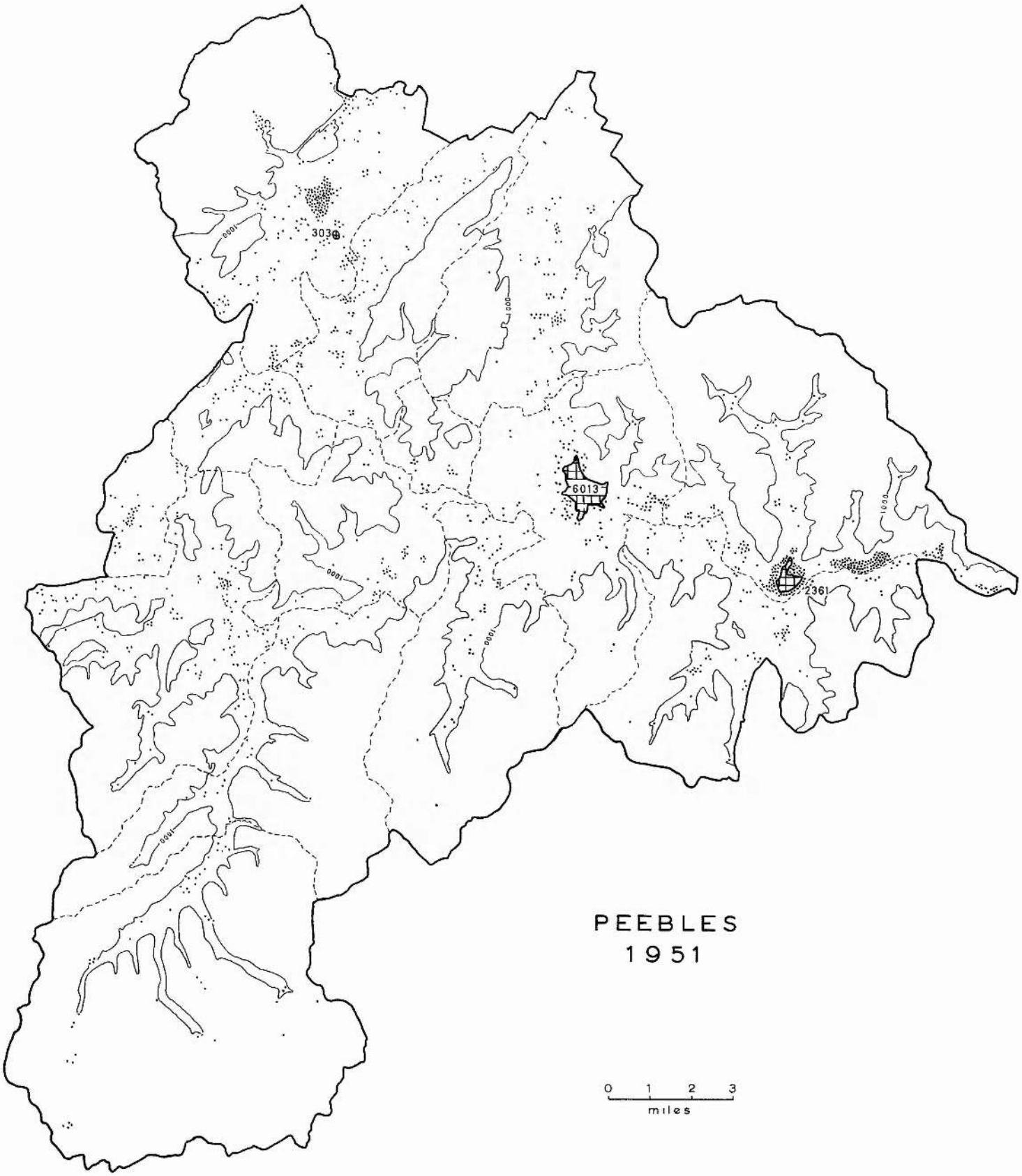
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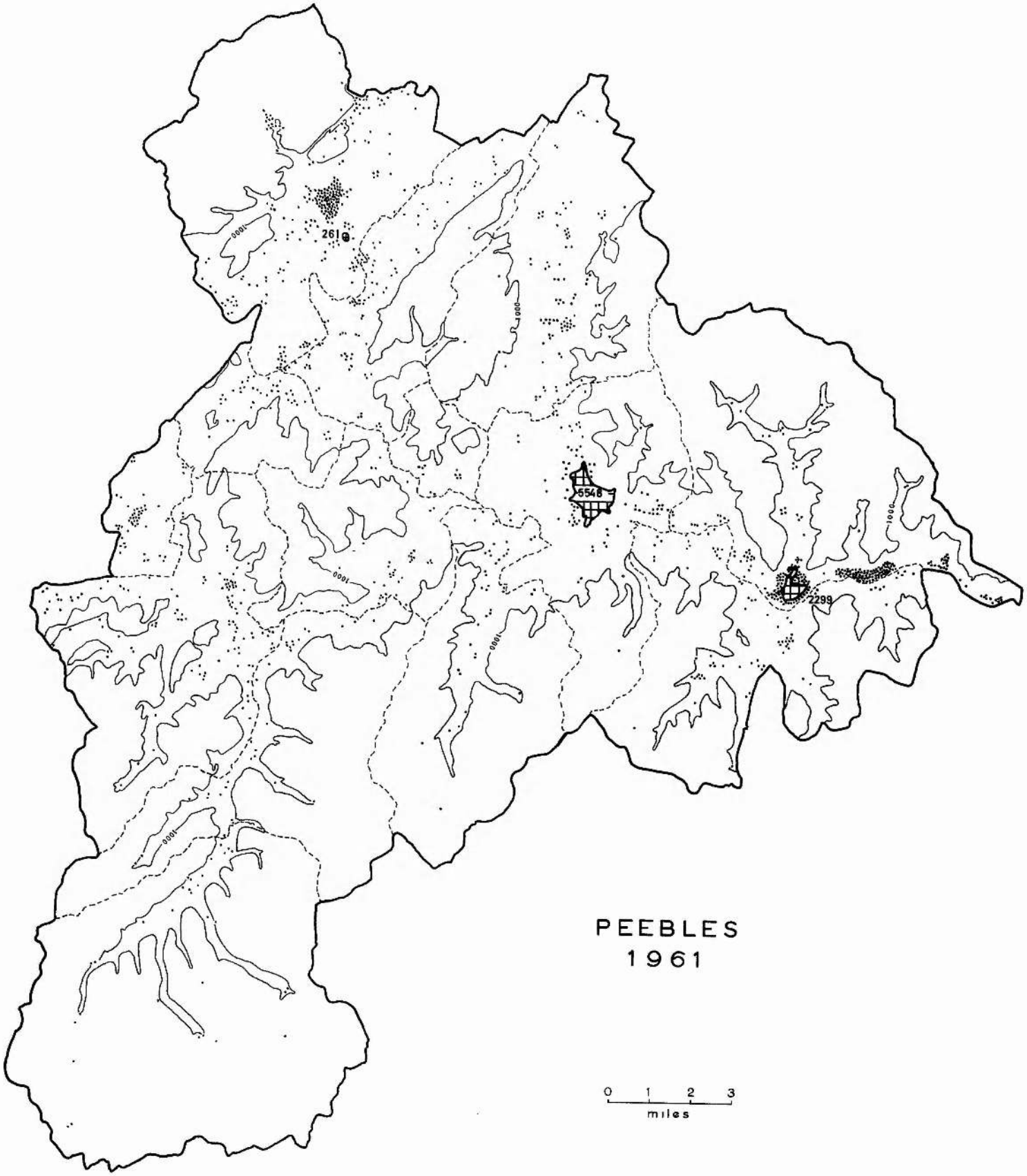
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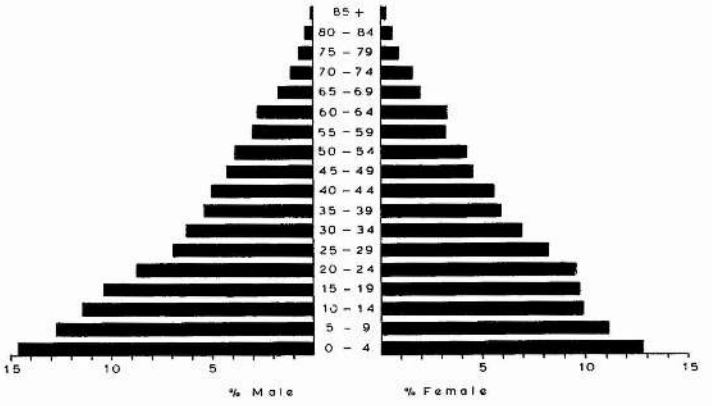
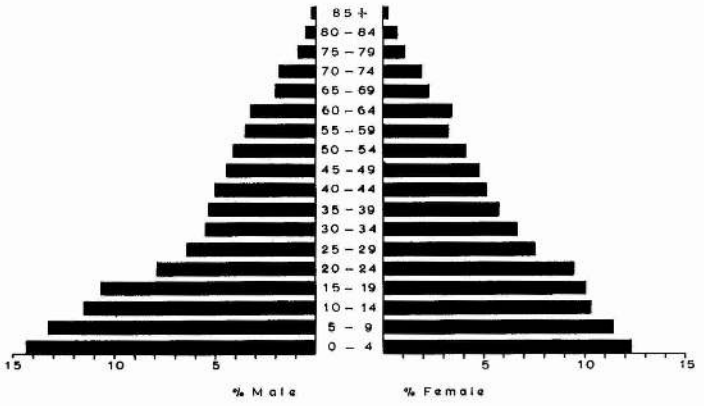
5548
299
1000
PEEBLES
1961
0 1 2 3
miles

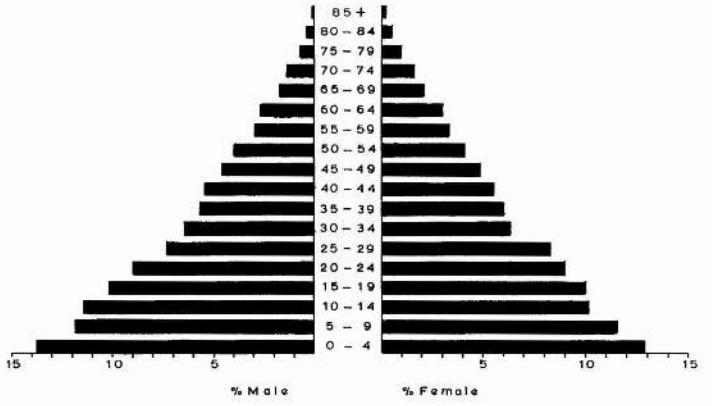
AGE / SEX STRUCTURE 1861



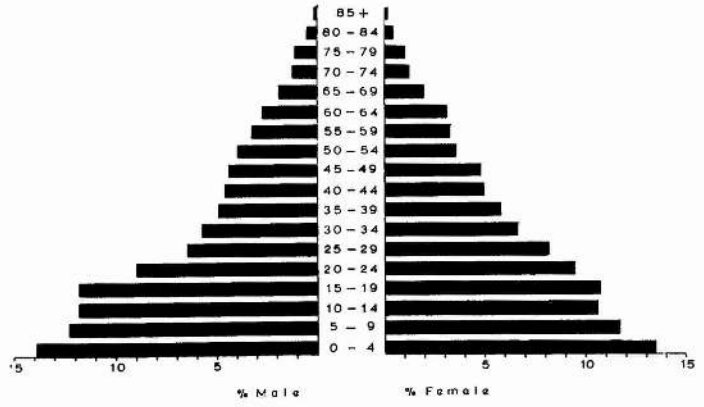
SCOTLAND



BERWICK



ROXBURGH



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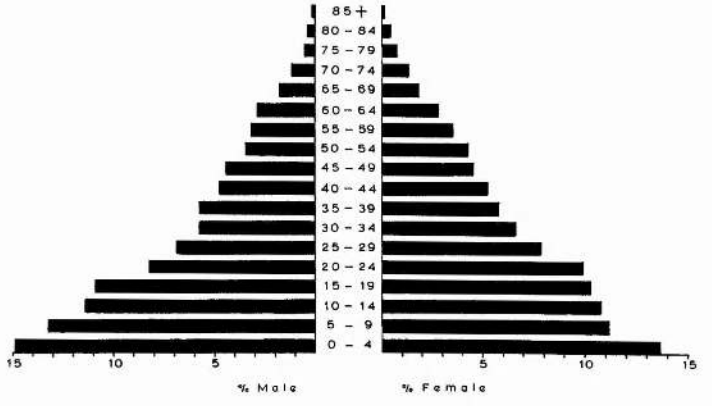
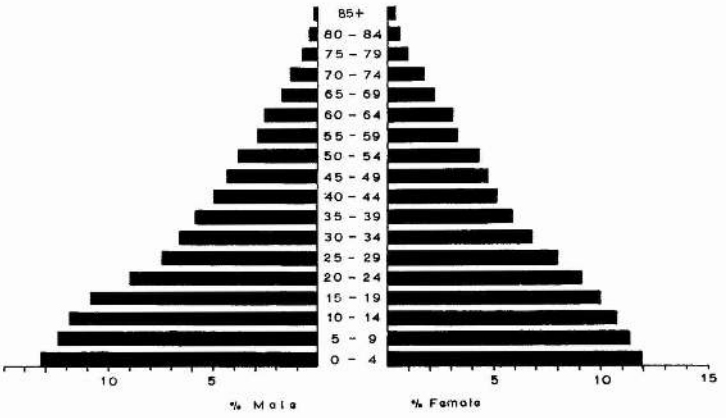


SELKIRK

AGE / SEX STRUCTURE 1891



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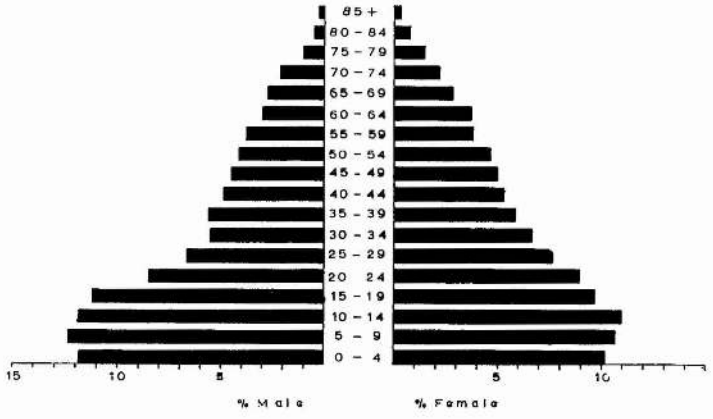

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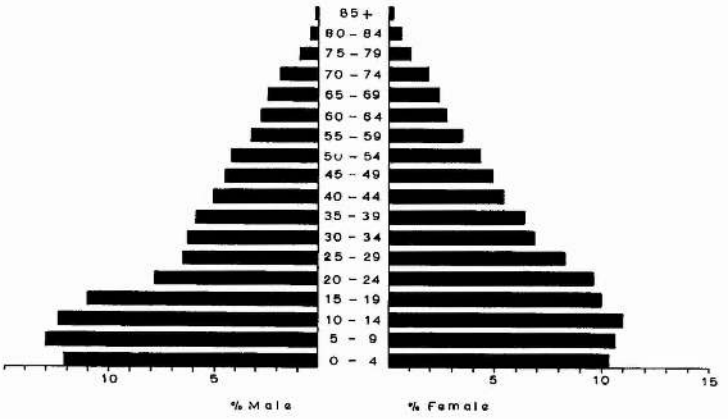

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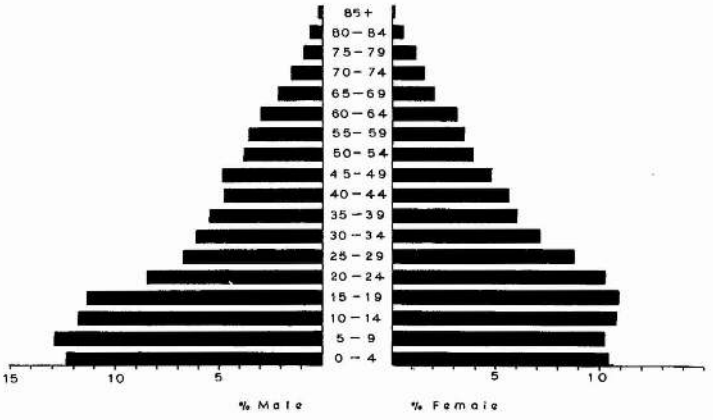

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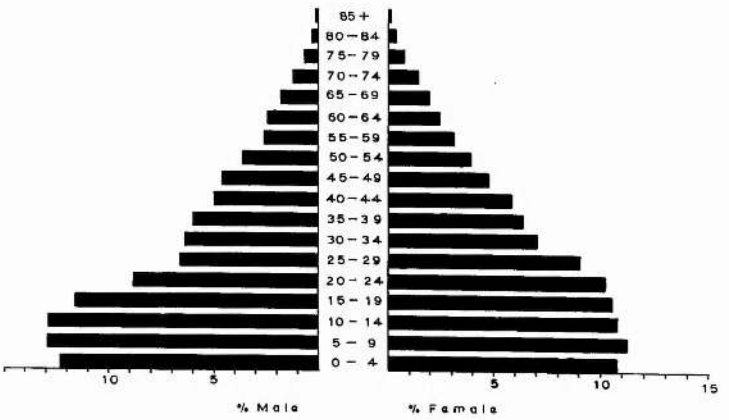
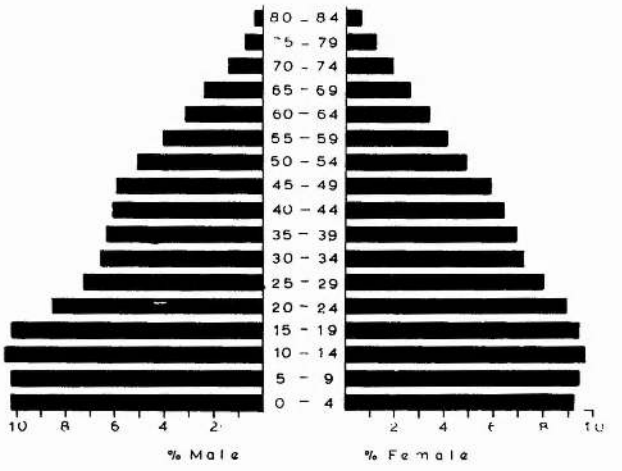


SELKIRK

AGE / SEX STRUCTURE 1921



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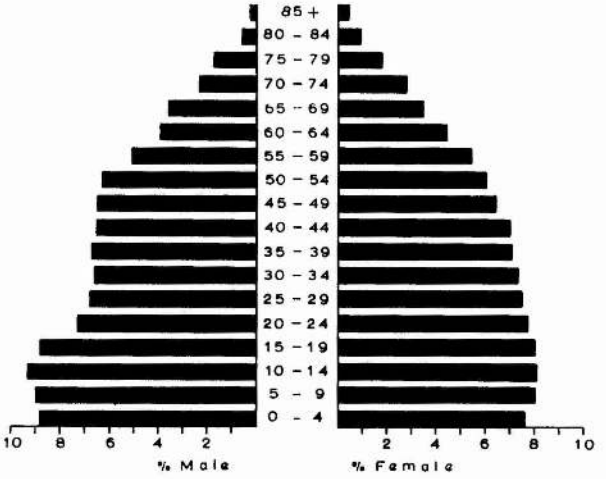

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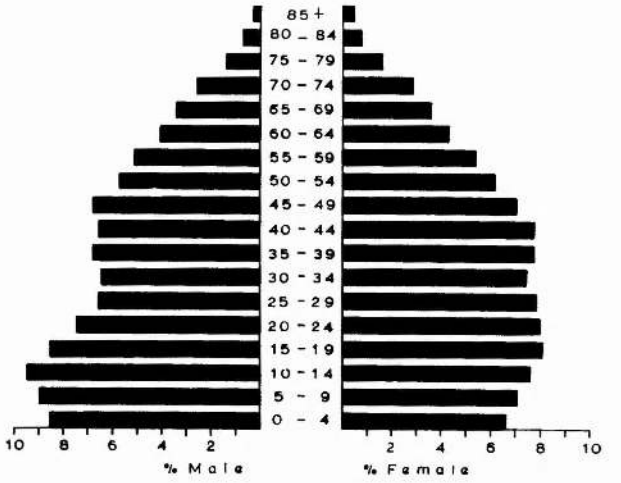

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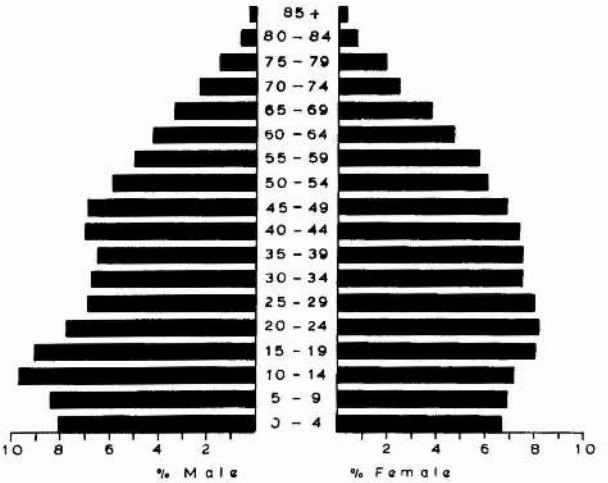

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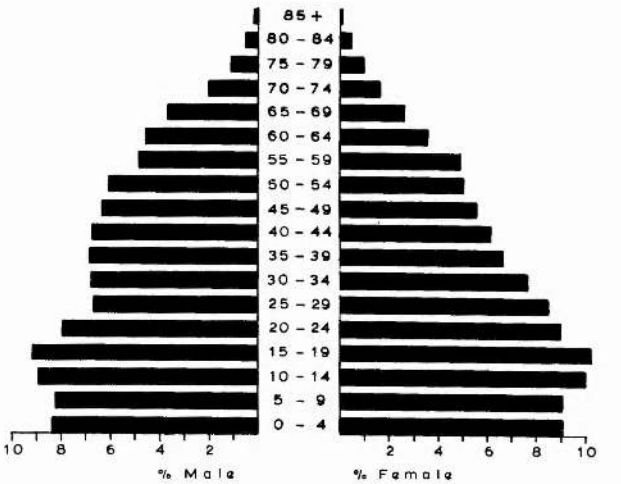
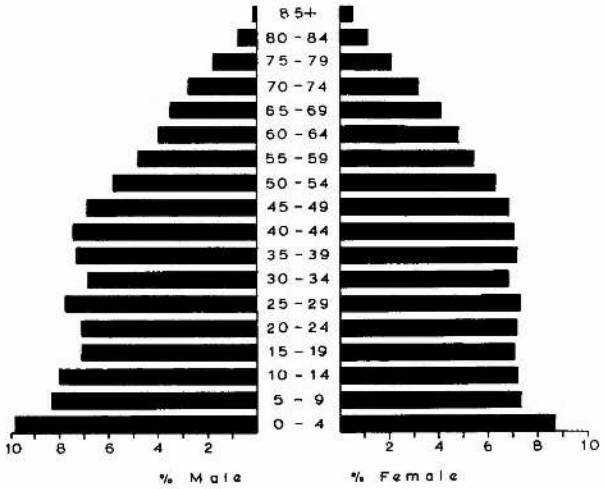


SELKIRK

AGE / SEX STRUCTURE 1951



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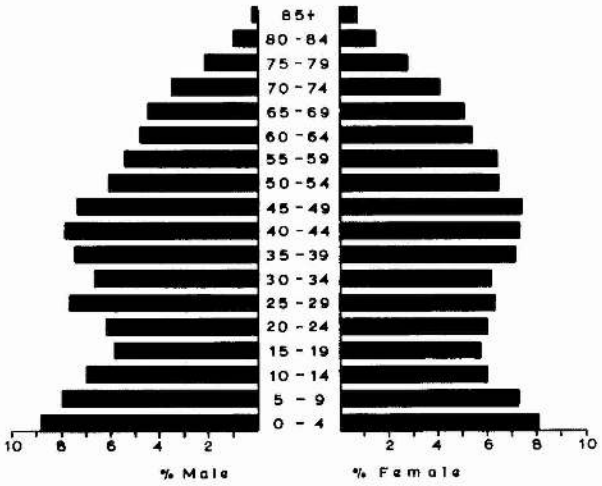

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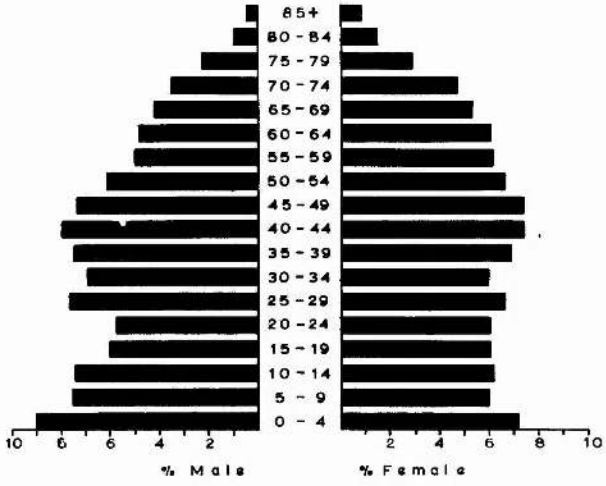

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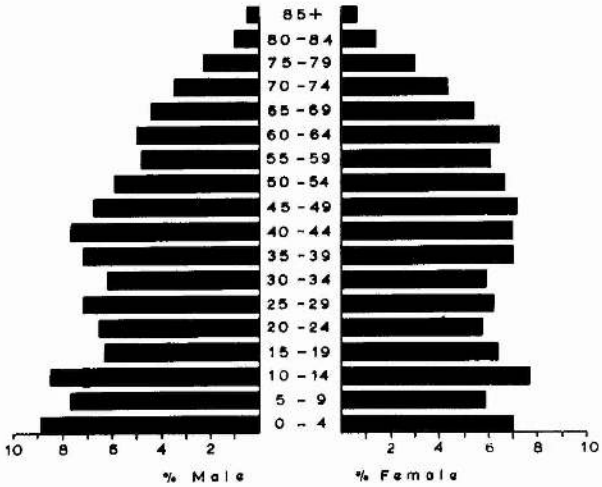

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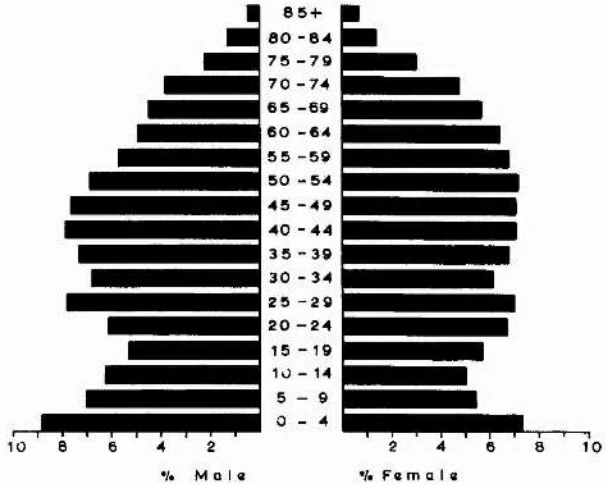
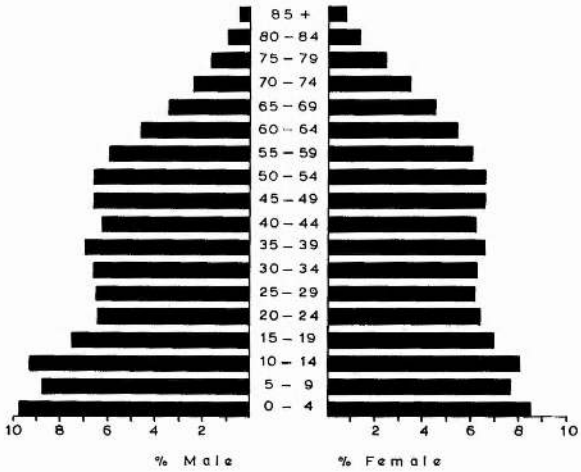
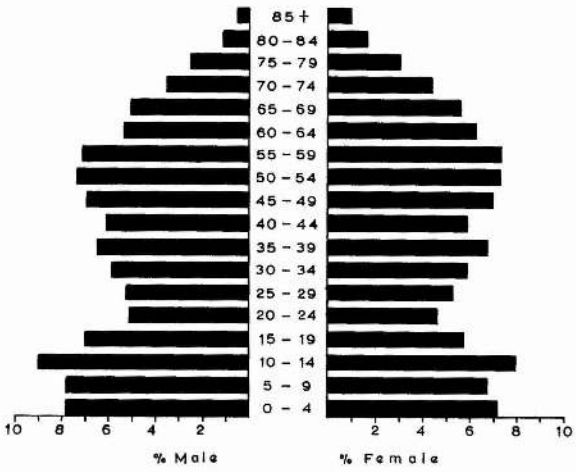


SELKIRK

AGE / SEX STRUCTURE 1961



SCOTLAND



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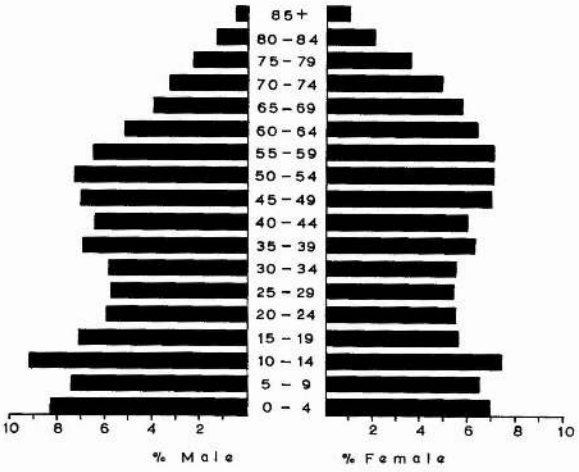

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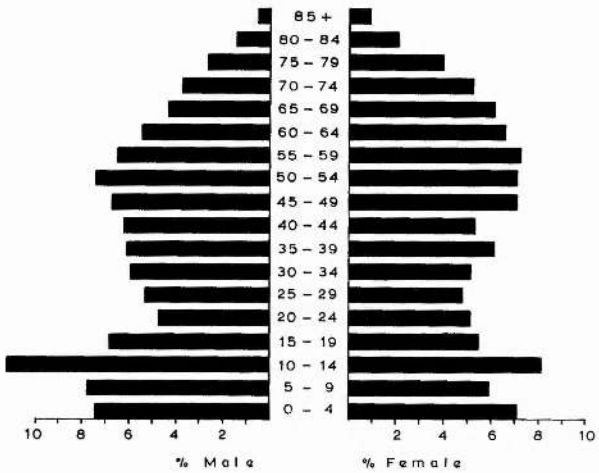

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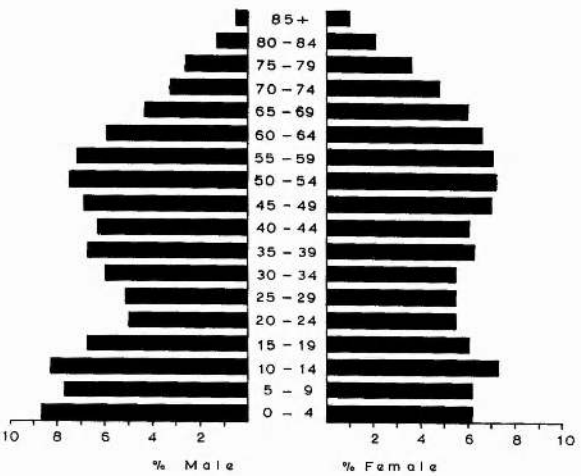
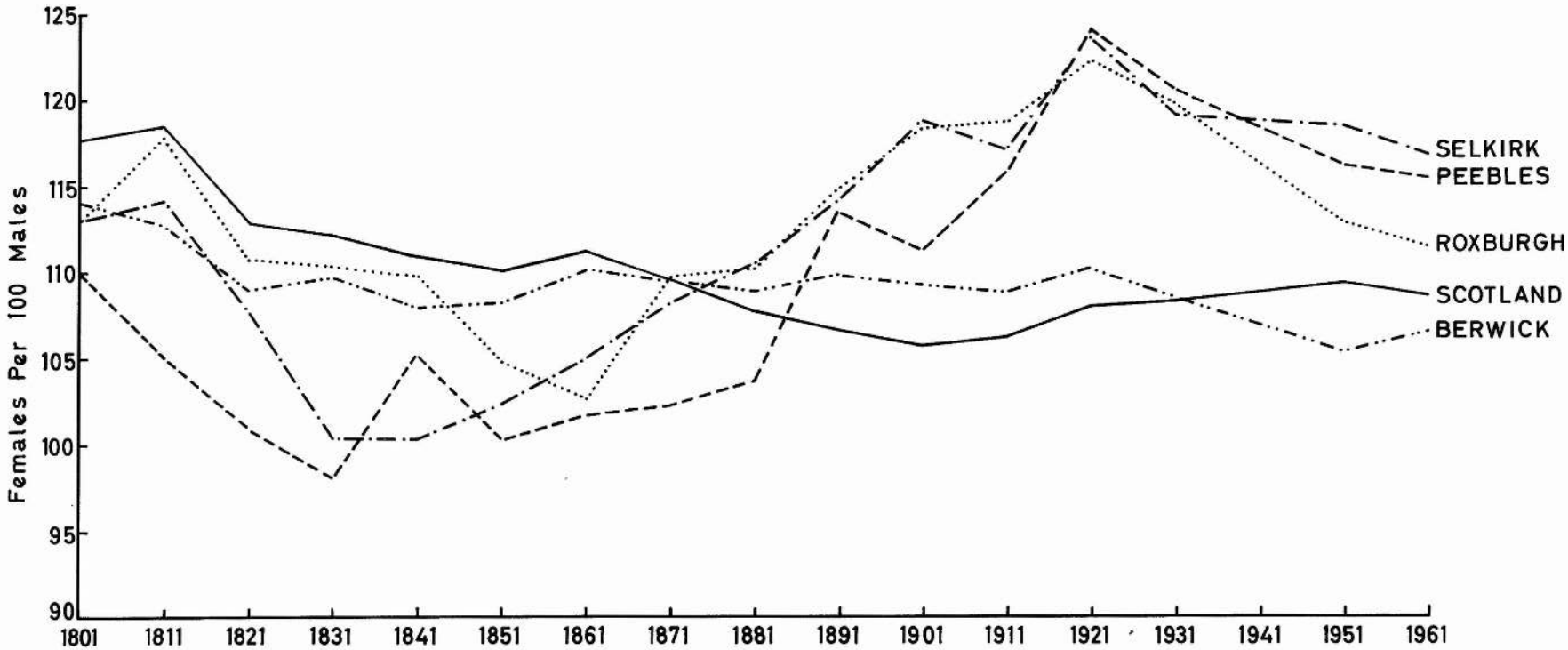
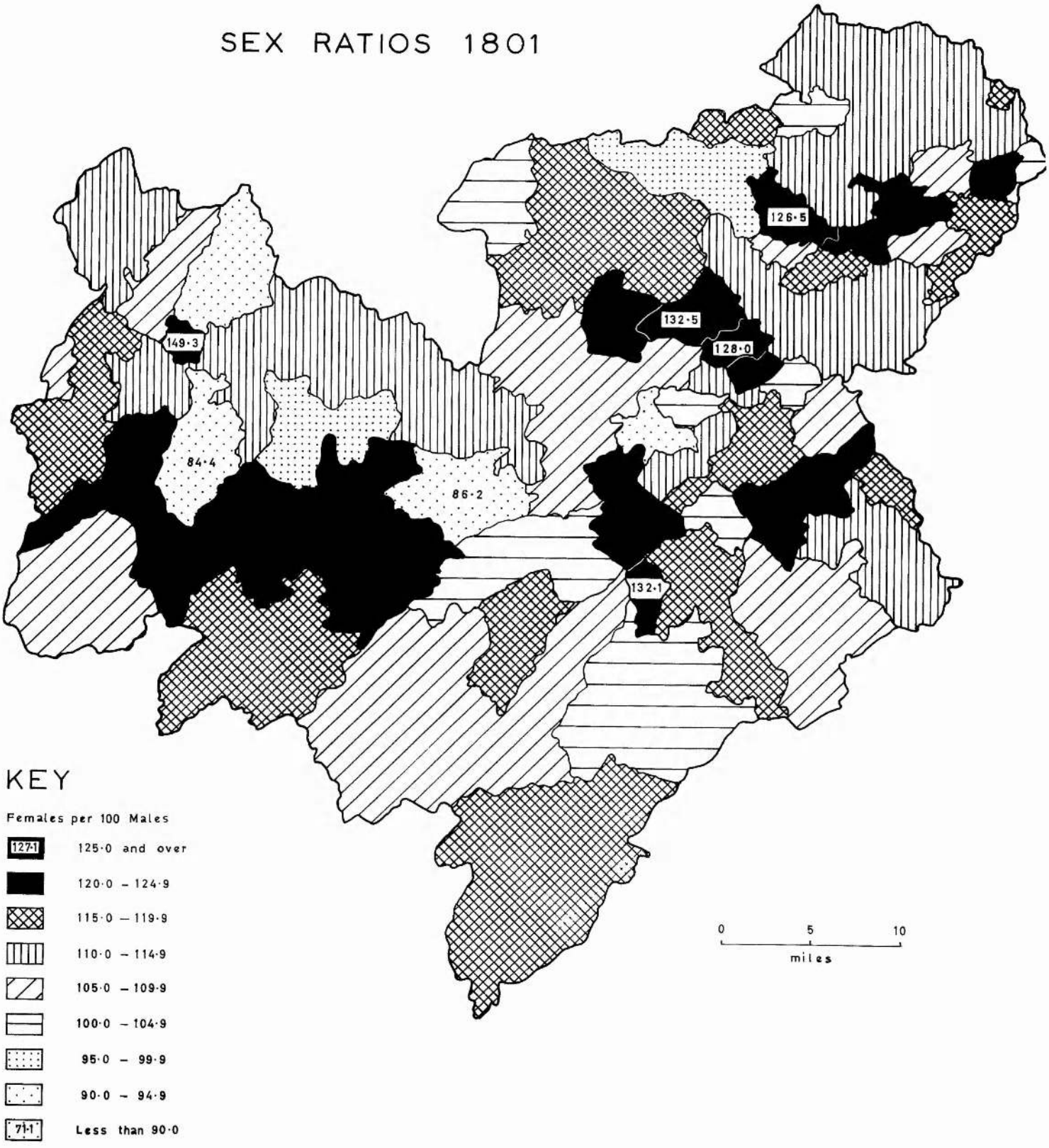


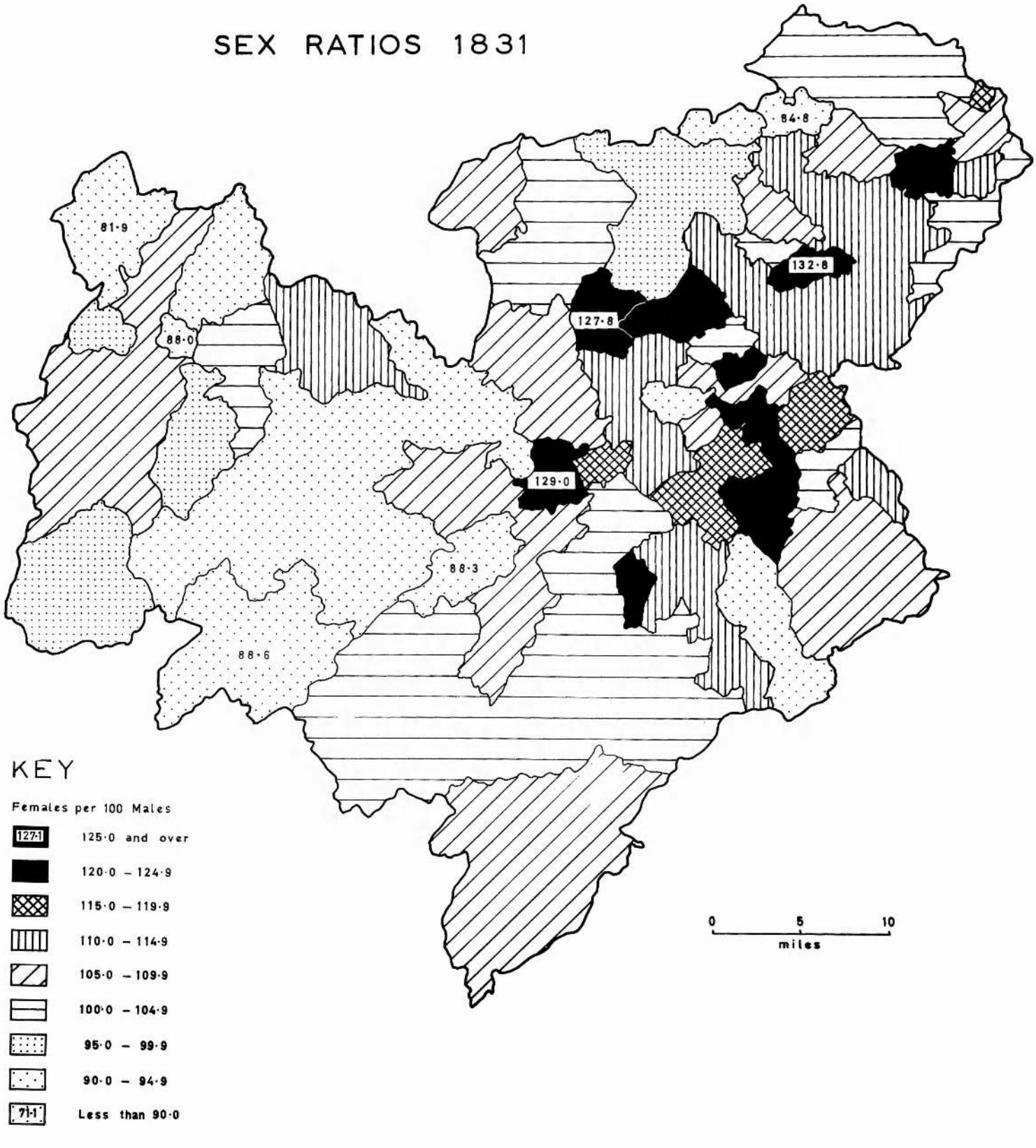
SELKIRK

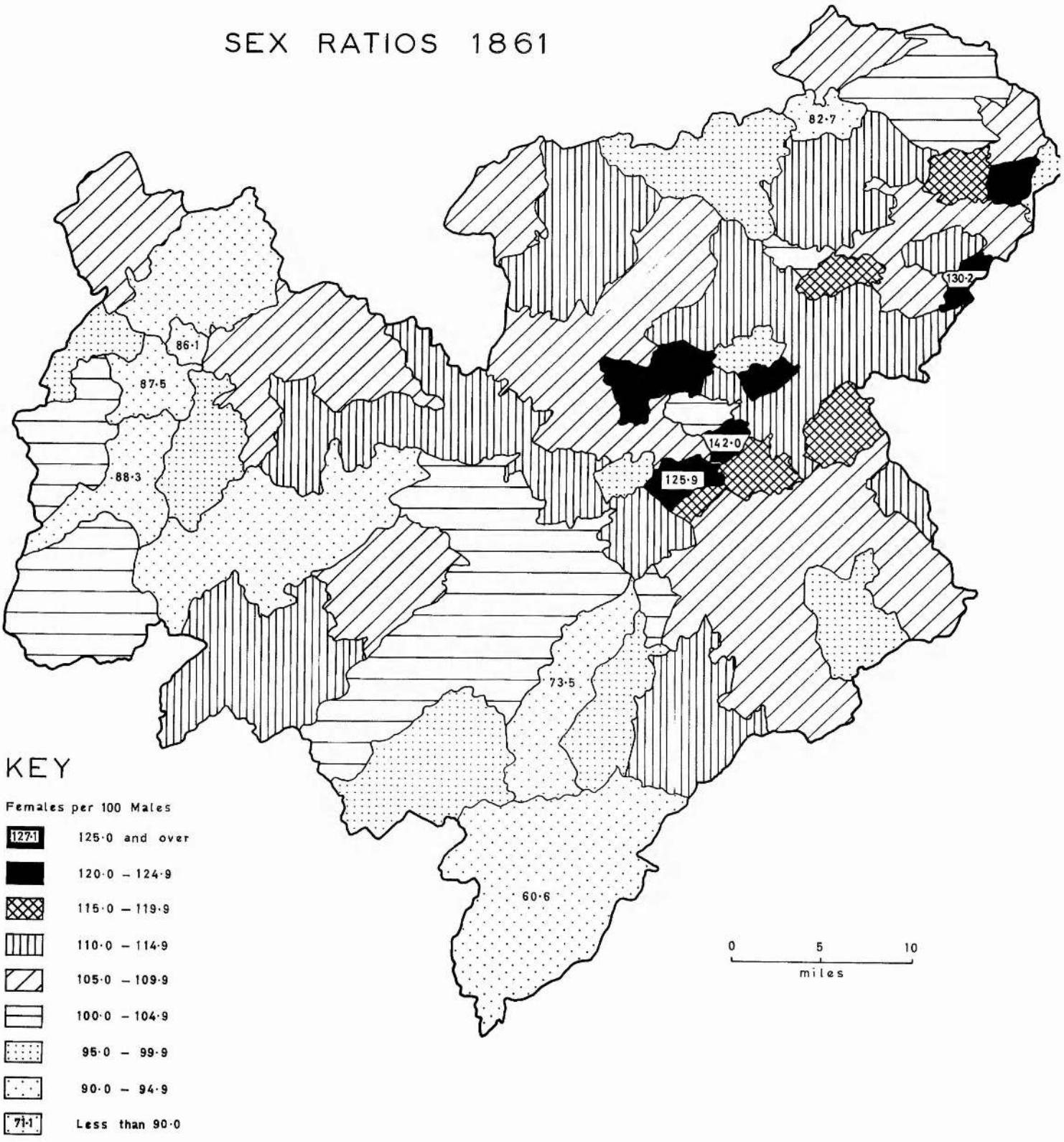
SEX RATIOS 1801 - 1961

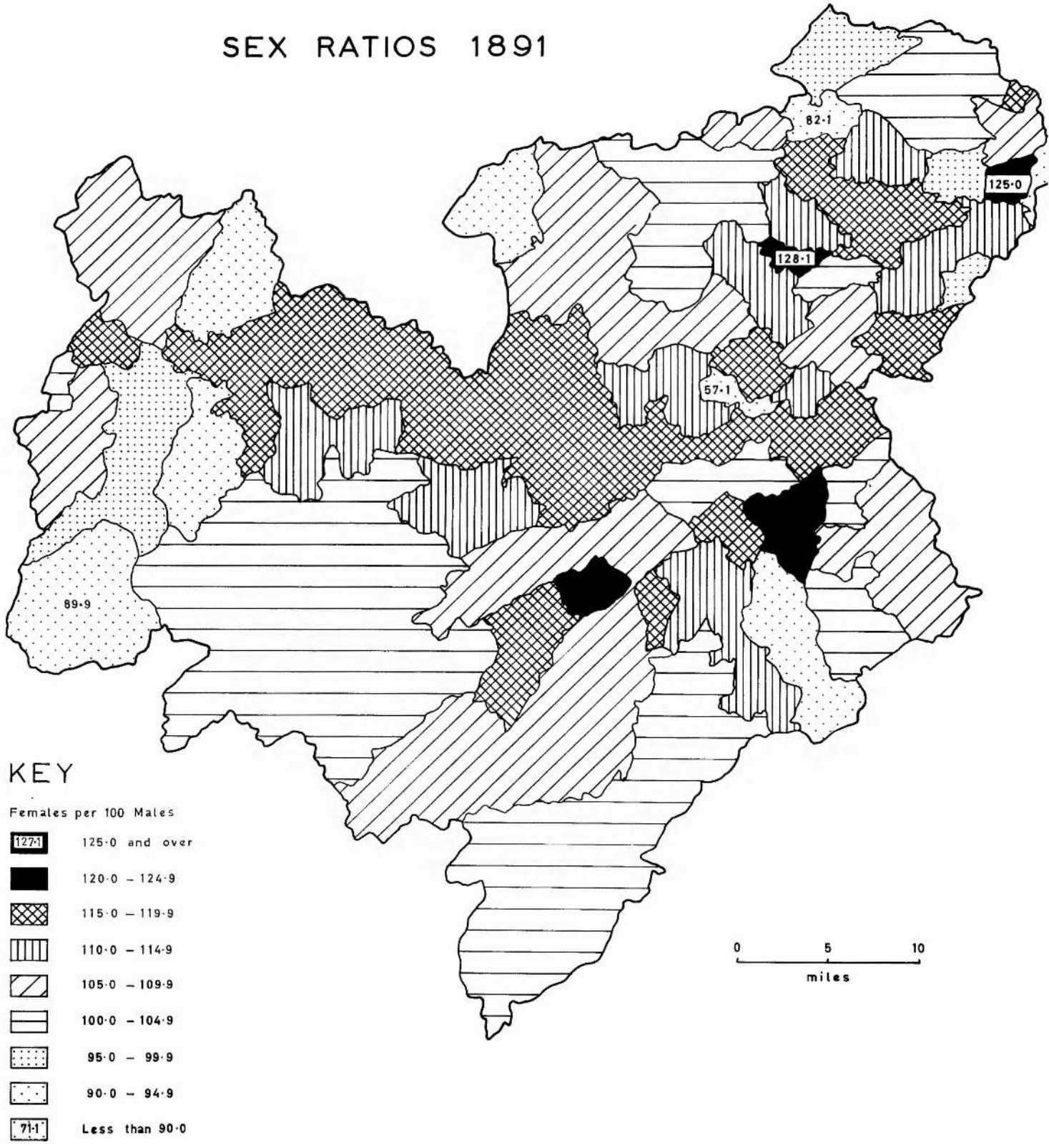


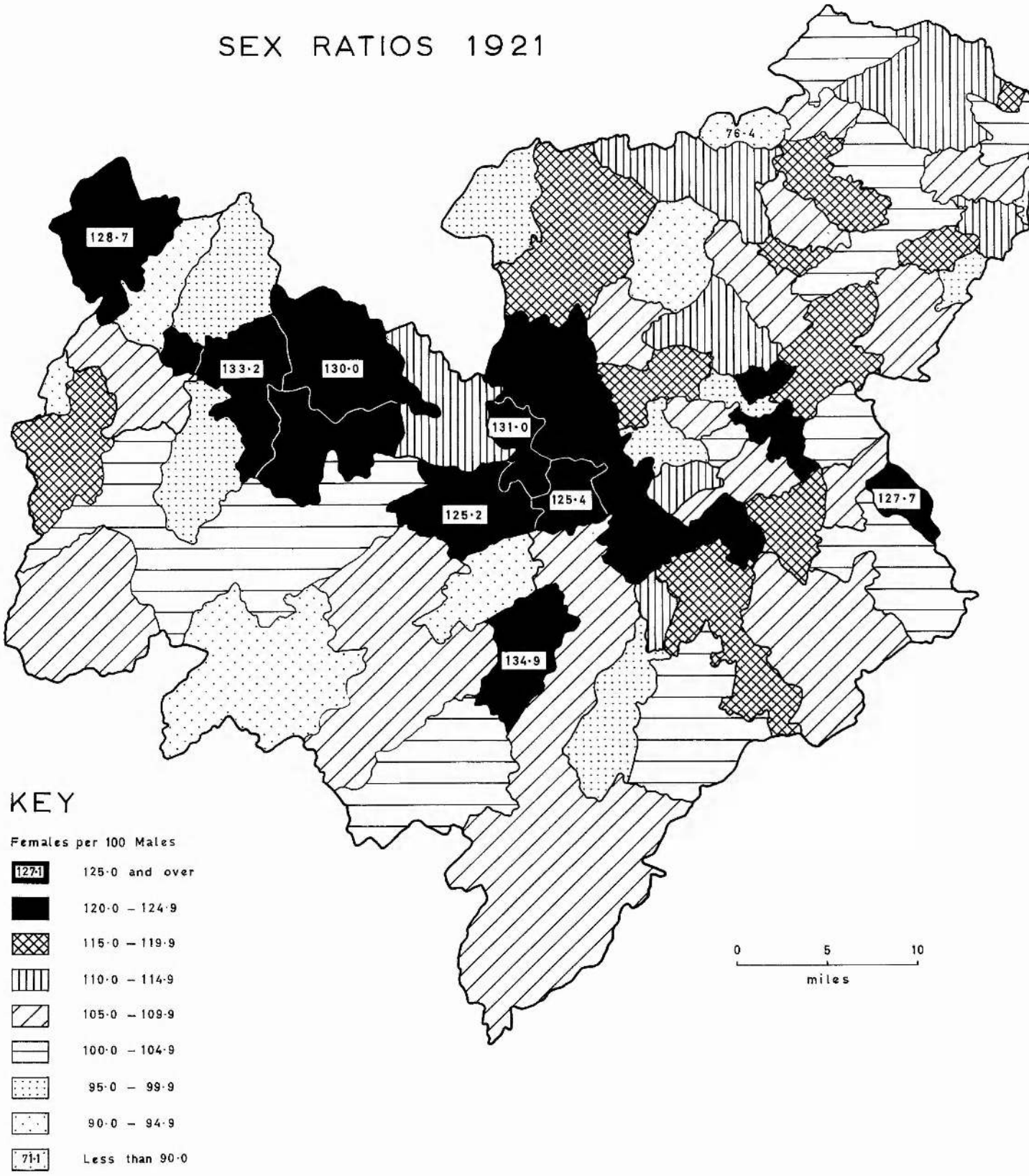

SEX RATIOS 1801
126·5
132·5
128·0
149·3
84·4
86·2
132·1
KEY
Females per 100 Males
127·1 125·0 and over
120·0 – 124·9
115·0 – 119·9
110·0 – 114·9
105·0 – 109·9
100·0 – 104·9
95·0 – 99·9
90·0 – 94·9
71·1 Less than 90·0
0 5 10
miles

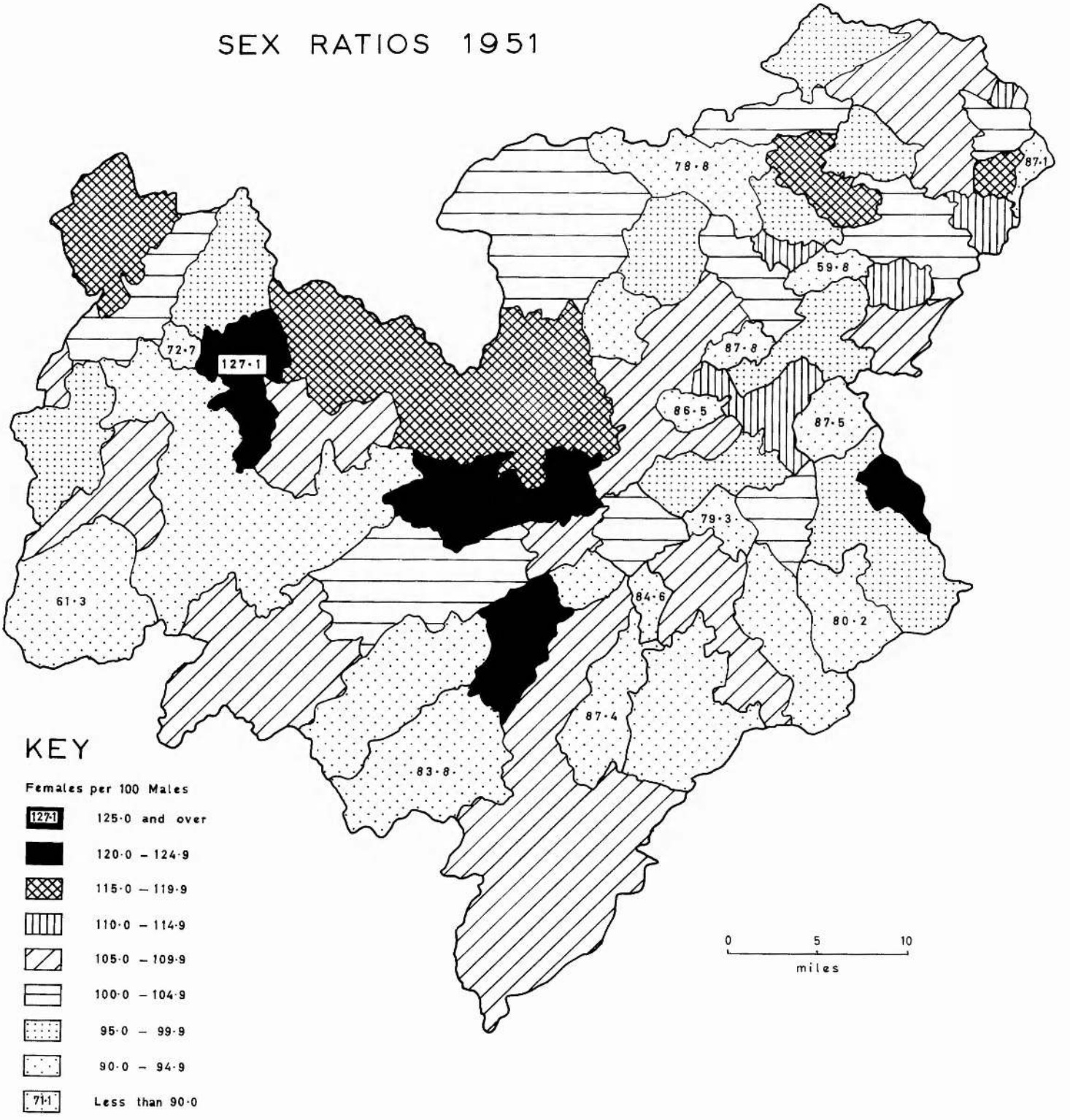
SEX RATIOS 1831

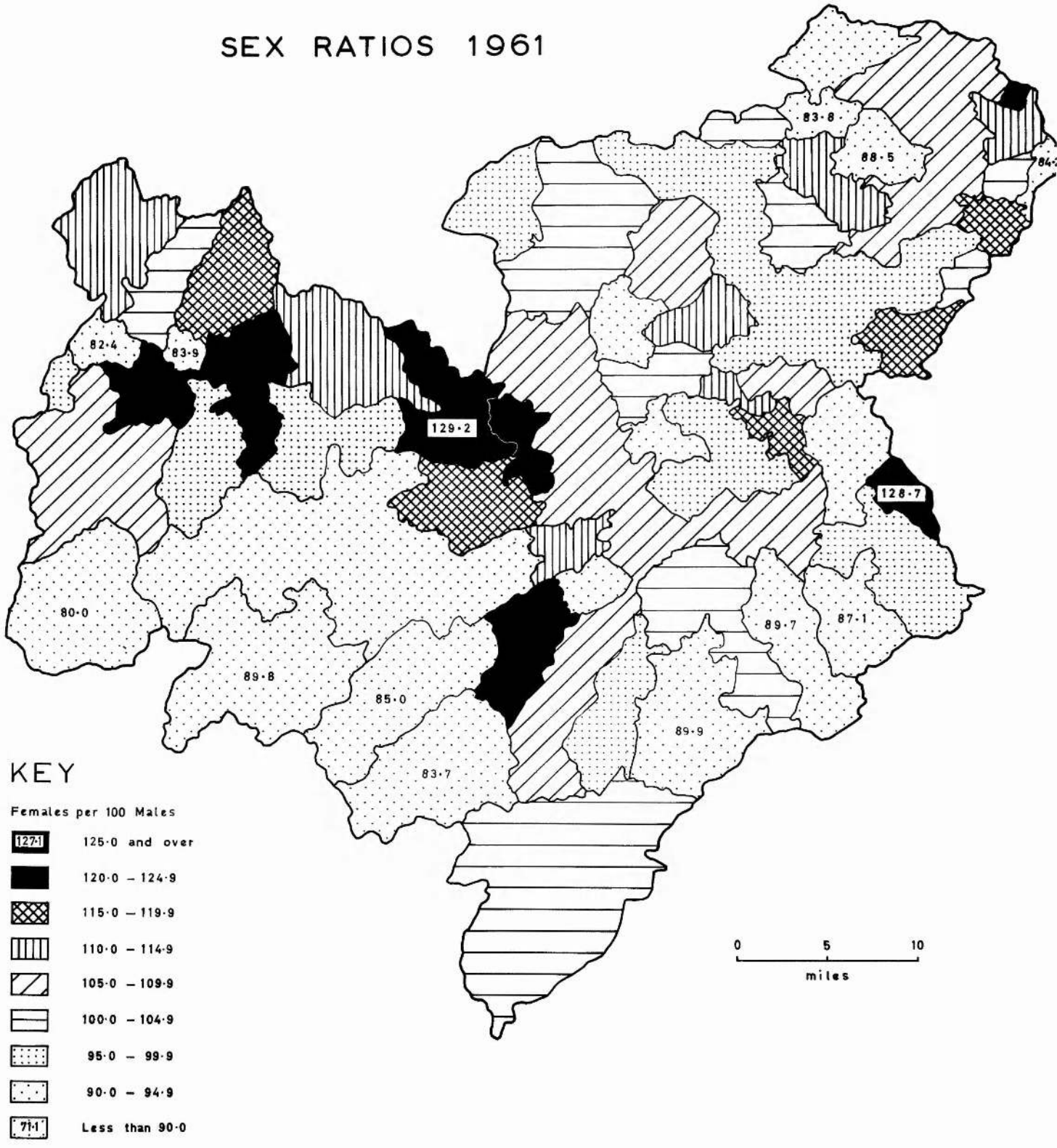



SEX RATIOS 1861
82·7
130·2
86·1
87·5
88·3
142·0
125·9
73·5
60·6
KEY
Females per 100 Males
127·1
125·0 and over
120·0 – 124·9
115·0 – 119·9
110·0 – 114·9
105·0 – 109·9
100·0 – 104·9
95·0 – 99·9
90·0 – 94·9
71·1
Less than 90·0
0
5
10
miles


SEX RATIOS 1891
82·1
125·0
128·1
57·1
89·9
KEY
Females per 100 Males
127·1
125·0 and over
120·0 – 124·9
115·0 – 119·9
110·0 – 114·9
105·0 – 109·9
100·0 – 104·9
95·0 – 99·9
90·0 – 94·9
71·1
Less than 90·0
0
5
10
miles

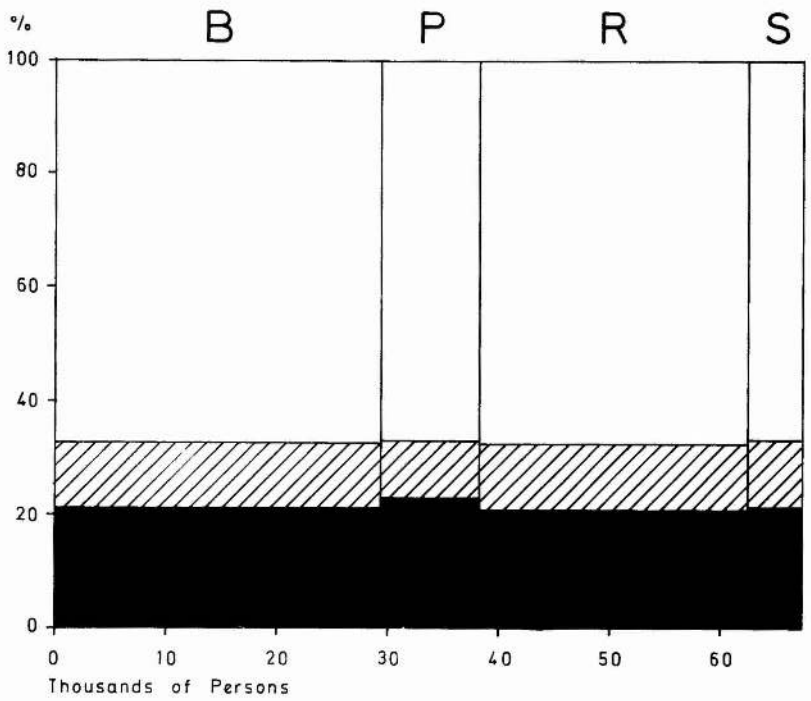

SEX RATIOS 1921
76·4
128·7
133·2
130·0
131·0
125·4
125·2
127·7
134·9
KEY
Females per 100 Males
127·1
125·0 and over
120·0 – 124·9
115·0 – 119·9
110·0 – 114·9
105·0 – 109·9
100·0 – 104·9
95·0 – 99·9
90·0 – 94·9
71·1
Less than 90·0
0
5
10
miles


SEX RATIOS 1951
78·8
87·1
59·8
72·7
127·1
87·8
86·5
87·5
79·3
61·3
84·6
80·2
87·4
83·8
KEY
Females per 100 Males
127·1
125·0 and over
120·0 – 124·9
115·0 – 119·9
110·0 – 114·9
105·0 – 109·9
100·0 – 104·9
95·0 – 99·9
90·0 – 94·9
71·1
Less than 90·0
0
5
10
miles


SEX RATIOS 1961
83·8
88·5
82·4
83·9
129·2
128·7
80·0
89·8
85·0
83·7
89·7
87·1
89·9
KEY
Females per 100 Males
127·1
125·0 and over
120·0 – 124·9
115·0 – 119·9
110·0 – 114·9
105·0 – 109·9
100·0 – 104·9
95·0 – 99·9
90·0 – 94·9
71·1
Less than 90·0
0
5
10
miles

OCCUPATIONAL COMPOSITION

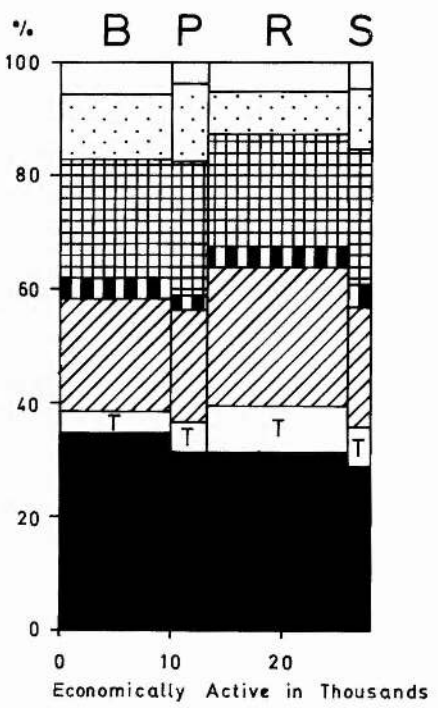
1801



KEY

- All Other Persons
- Chiefly Employed in Trade
- Chiefly Employed in Agriculture

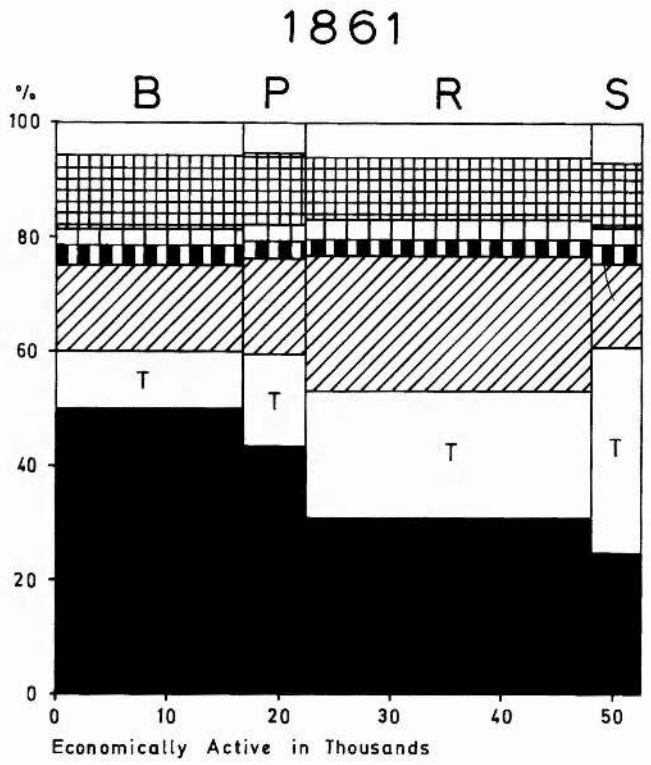
1831

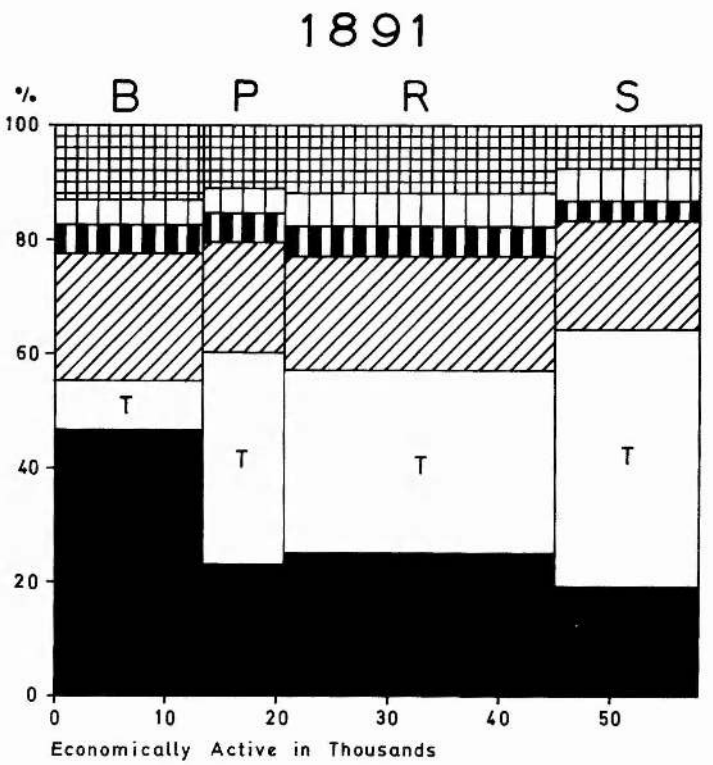


KEY

- Other Males 20 Years of Age
- Labourers not Agricultural
- Servants
- Professional
- Retail Trade and Handicrafts
- T Textiles
- Agricultural

OCCUPATIONAL COMPOSITION





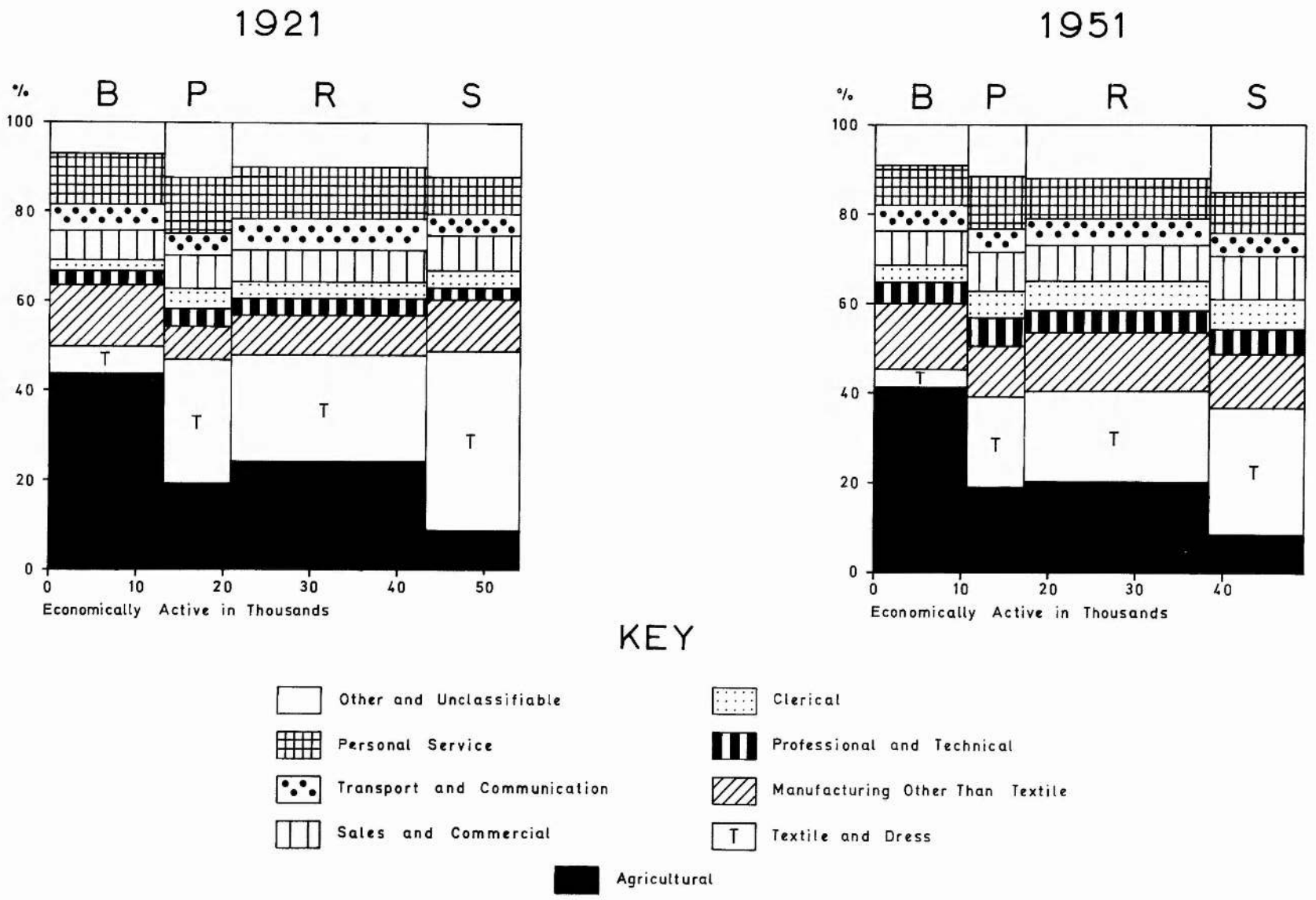
KEY

- Indefinite and Non-Productive
- Domestic
- Commercial
- Professional
- Other Industrial
- T Textile and Dress
- Agricultural

KEY

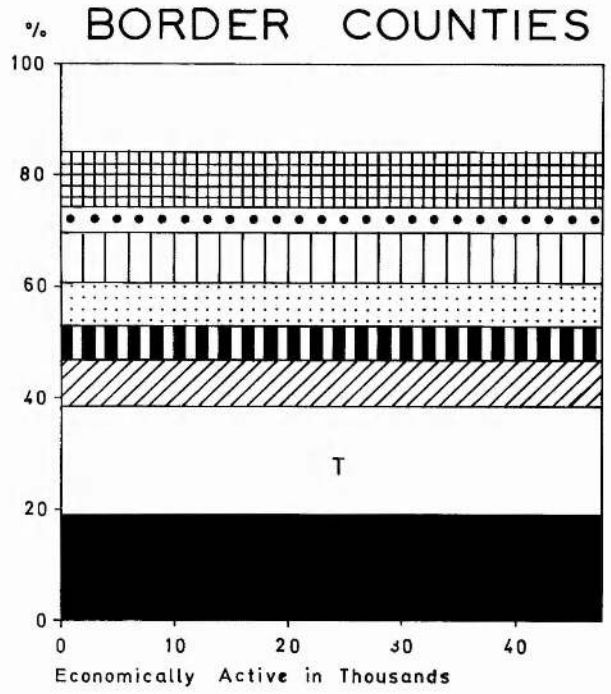
- Domestic
- Commercial
- Professional
- Other Industrial
- T Textile and Dress
- Agricultural

OCCUPATIONAL COMPOSITION



OCCUPATIONAL COMPOSITION

1961

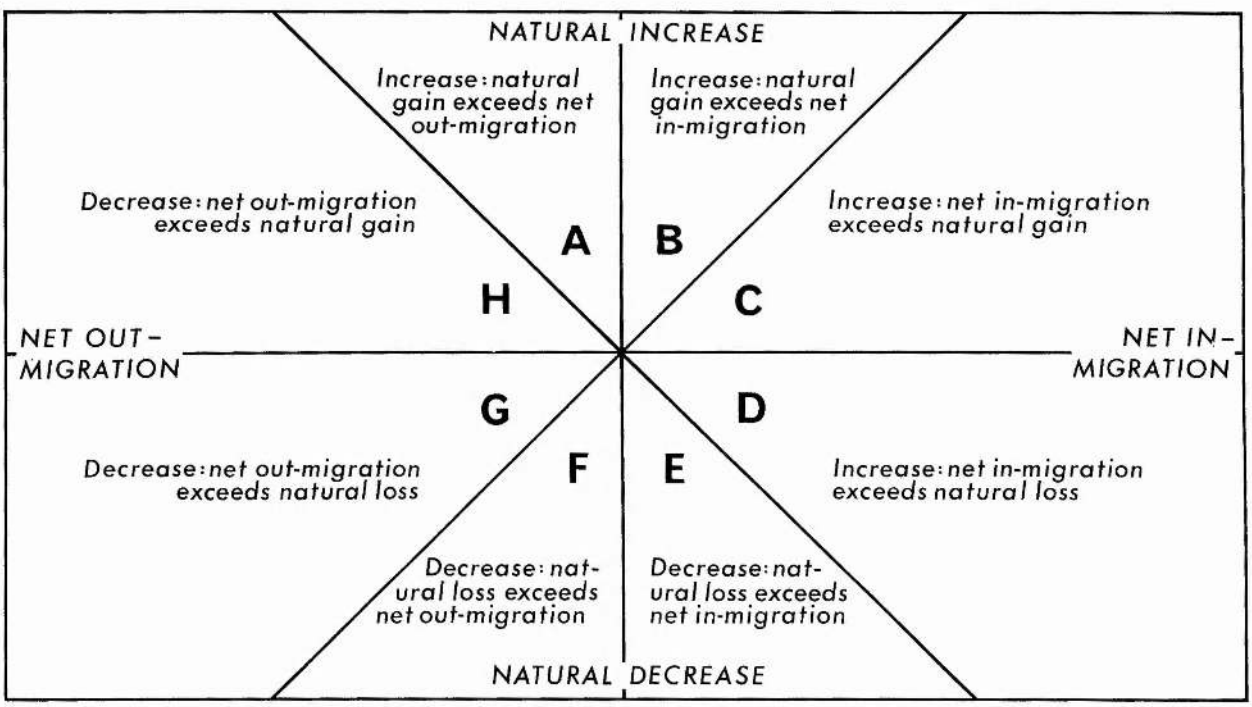


KEY

- Other and Unclassifiable
- Personal Service
- Transport and Communication
- Sales and Commercial
- Clerical
- Professional and Technical
- Manufacturing Other Than Textile
- T — Textile and Dress
- Agricultural

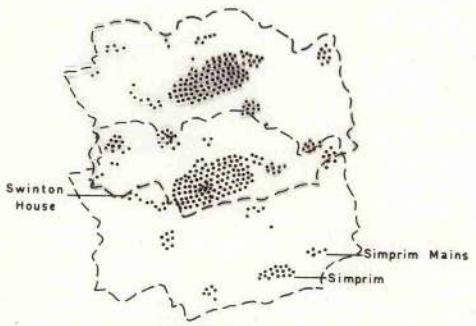
A TYPOLOGY OF POPULATION CHANGE
1861 – 1960

	1861-1870	1871-1880	1881-1890	1891-1900	1901-1910	1911-1920	1921-1930	1931-1950	1951-1960
BERWICK	H	H	H	H	H	H	H	H	G
PEEBLES	A	A	A	A	A	A	H	A	H
ROXBURGH	H	H	A	H	H	H	B	A	H
SELKIRK	B	C	A	H	A	H	A	G	H

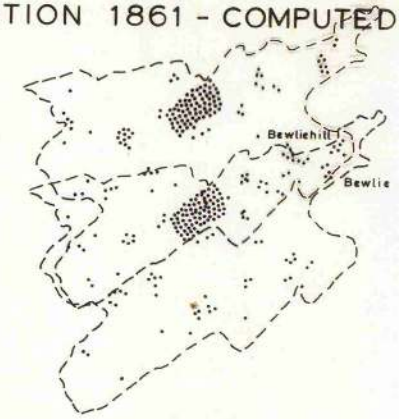


After Webb J.W. (1963)

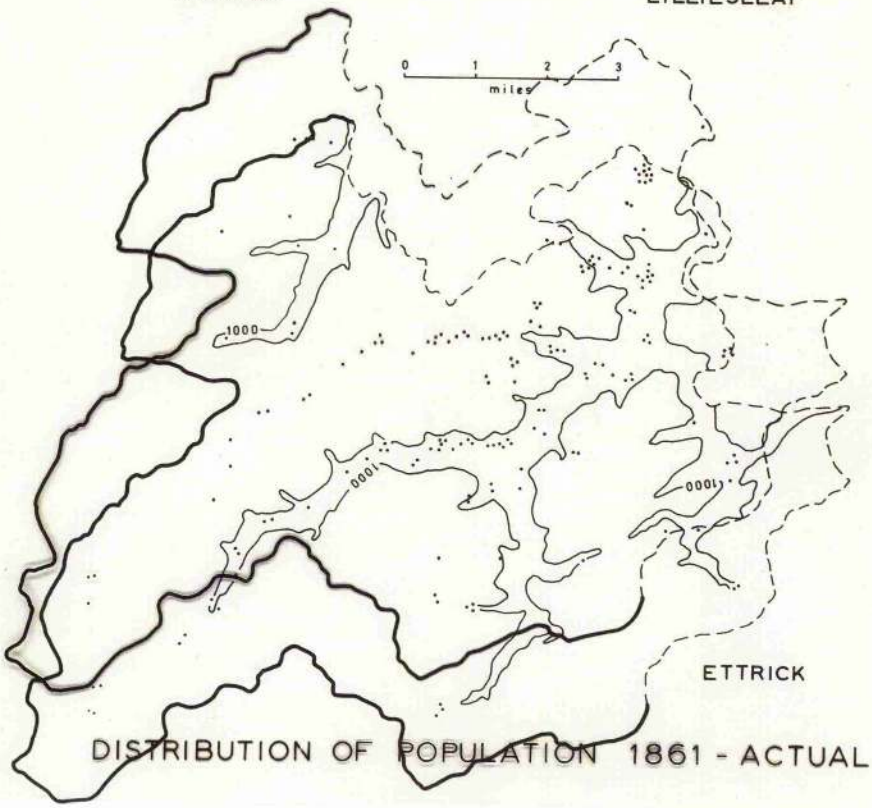
DISTRIBUTION OF POPULATION 1861 - COMPUTED



SWINTON



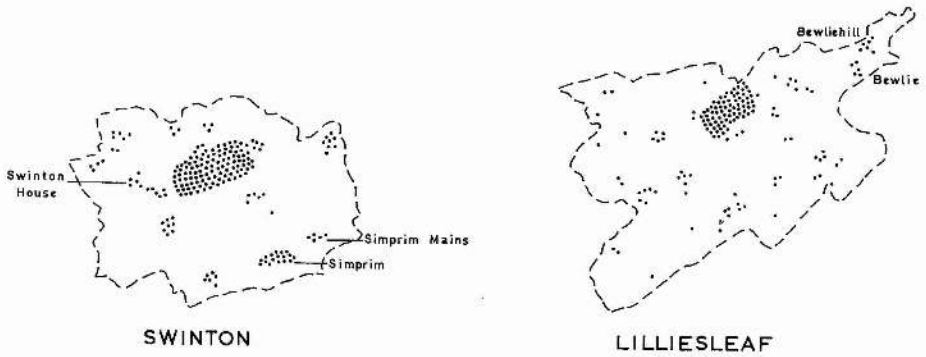
LILLIESLEAF



ETTRICK

DISTRIBUTION OF POPULATION 1861 - ACTUAL

DISTRIBUTION OF POPULATION 1861 - COMPUTED



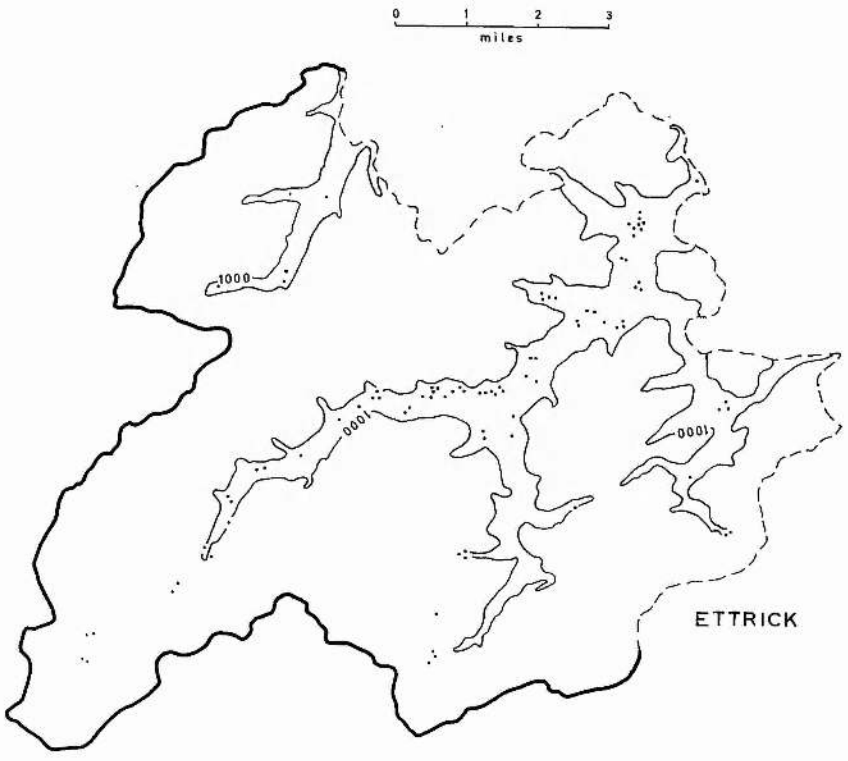


TABLE II.1: AVERAGE NUMBER OF PERSONS PER INHABITED HOUSE: BORDER COUNTIES AT VARIOUS DATES 1821-1961

	1821	1861	1891	1921	1951	1961	Mean average for the 6 dates
Berwick	5.8	5.7	4.7	4.0	3.4	3.1	4.5
Peebles	5.7	5.8	4.9	4.2	3.5	3.1	4.6
Roxburgh	6.2	7.0	4.9	4.0	3.4	3.1	4.8
Selkirk	6.1	7.1	5.1	4.0	3.2	3.0	4.7

Source: Calculated from Census of Scotland.

TABLE II.2: PERCENTAGE OF POPULATION IN BURGHAL AND LANDWARD: BORDER COUNTIES 1841-1961

		1841	1851	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961
Berwick:	burghal	N/D	N/D	19.8	21.8	22.2	21.7	22.1	22.1	22.7	22.1	24.8	25.9
	landward			80.2	78.0	77.8	78.3	77.9	77.9	77.3	77.9	75.2	74.1
Peebles:	burghal	22.5	N/D	27.8	34.4	42.0	48.8	49.4	53.1	51.8	54.6	55.0	55.4
	landward	77.5		72.2	65.6	58.0	51.2	50.6	46.9	48.2	45.4	45.0	44.6
Roxburgh:	burghal	30.3	36.3	36.4	46.8	48.3	52.5	54.4	54.6	54.4	56.8	59.4	61.0
	landward	69.7	63.7	63.6	53.2	51.7	47.5	45.6	45.4	45.6	43.2	40.6	39.0
Selkirk:	burghal	43.2	59.9	62.2	82.1	83.3	83.8	83.1	83.0	82.8	83.9	84.5	85.5
	landward	57.8	40.1	37.8	17.9	16.7	16.2	16.2	17.0	17.2	17.0	15.5	14.5

N/D — no data available.
Source: Calculated from Census of Scotland.

TABLE III.1: PERCENTAGE OF POPULATION UNDER 15: SCOTLAND AND BORDER COUNTIES 1841-1961

	1841	1851	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961
Scotland	36.3	35.6	36.1	36.7	36.6	35.5	33.4	32.3	29.9	26.9	24.6	25.9
Berwick	35.8	36.0	36.4	36.9	35.7	33.6	29.8	27.4	25.3	23.4	22.6	23.3
Peebles	34.6	36.7	36.7	37.4	35.7	33.8	29.2	27.0	25.0	21.1	22.6	23.6
Roxburgh	36.2	36.3	35.8	36.9	35.3	34.4	29.3	26.3	23.9	21.6	21.6	22.8
Selkirk	38.5	38.0	37.9	35.8	38.0	35.2	29.5	29.5	22.4	21.1	19.7	21.9

Source: Calculated from Census of Scotland.

TABLE III.2: PERCENTAGE OF POPULATION AGED 15-64: SCOTLAND AND BORDER COUNTIES 1841-1961

	1841	1851	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961
Scotland	59.4	59.5	59.4	58.1	58.4	59.3	61.8	62.4	64.5	66.8	65.4	63.5
Berwick	58.9	58.5	57.8	56.8	57.8	59.4	63.0	64.6	65.7	66.6	64.6	62.5
Peebles	56.7	58.2	58.5	57.6	58.5	60.9	65.2	66.4	68.3	68.4	63.7	63.6
Roxburgh	58.9	59.2	59.3	57.8	59.3	59.7	64.6	66.5	67.3	69.0	65.1	62.7
Selkirk	57.2	58.0	58.1	59.8	58.0	60.5	67.2	67.5	68.1	69.3	66.7	63.2

Note: Figures in brackets are estimates; for method of estimation see text.
Source: Calculated from Census of Scotland.

TABLE III.3: PERCENTAGE OF POPULATION OVER 64: SCOTLAND AND BORDER COUNTIES 1841-1961

	1841	1851	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961
Scotland	4.5	4.8	4.9	5.2	5.0	5.1	4.8	5.3	6.0	7.3	10.0	10.6
Berwick	(5.3)	5.5	5.8	6.3	6.5	7.0	7.2	8.0	9.0	10.0	12.8	14.2
Peebles	(4.7)	5.1	4.8	5.0	5.8	5.3	5.8	6.6	8.7	10.5	13.5	15.8
Roxburgh	(4.9)	4.5	4.9	5.3	5.4	5.9	6.1	7.2	8.8	9.4	13.3	14.5
Selkirk	(4.3)	4.0	4.5	4.4	4.0	4.3	5.3	6.0	8.1	9.6	13.8	14.9

Note: Figures in brackets are estimates; for method of estimation see text.
Source: Calculated from Census of Scotland.

TABLE III.4: DEPENDENCY RATIO: SCOTLAND AND BORDER COUNTIES 1841-1961

	1841	1851	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961
Scotland	69.5	67.8	69.5	72.1	71.2	68.6	61.8	60.3	55.0	52.0	52.9	57.5
Berwick	(69.8)	70.9	72.9	76.0	72.9	68.4	58.8	54.9	52.2	50.2	54.8	60.0
Peebles	(76.4)	71.8	71.1	73.8	71.0	64.2	53.8	50.5	46.5	46.1	56.5	65.0
Roxburgh	(69.8)	69.0	68.5	72.9	68.5	67.7	55.0	50.3	48.6	44.9	53.6	59.5
Selkirk	(74.8)	72.5	72.4	67.3	72.3	65.3	53.4	45.9	44.7	44.3	50.4	58.2

Note: Figures in brackets are partially based on estimates.
Source: Calculated from Census of Scotland.

TABLE III.5: AGE-SPECIFIC SEX RATIOS: SCOTLAND AND BORDER COUNTIES 1961

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54
Scotland	96.8	97.0	95.5	104.4	119.0	130.0	123.0	127.7	120.1	117.0	120.4
Berwick	94.9	95.4	97.6	104.3	132.0	128.1	132.5	117.9	111.8	116.9	110.7
Peebles	97.8	95.1	90.6	91.2	106.1	126.0	118.6	119.0	109.8	107.7	88.9
Roxburgh	94.4	98.3	90.3	99.5	102.3	115.9	98.6	106.9	101.0	106.7	104.6
Selkirk	96.5	88.6	98.8	98.7	123.4	119.5	118.9	103.1	116.5	106.6	124.6

	55-59	60-64	65-69	70-74	75-79	80-84	85+
Sc.	119.4	131.4	133.9	144.1	143.4	158.7	180.0
Be.	108.0	118.3	124.2	122.1	151.8	155.8	193.3
Pe.	101.6	113.0	98.2	97.1	88.7	83.3	112.5
Ro.	114.2	113.4	127.2	118.8	133.7	135.1	150.0
Se.	116.0	102.1	112.5	115.0	128.6	105.0	116.7

Source: Calculated from Census of Scotland, 1861.

TABLE III.6: AGE-SPECIFIC SEX RATIOS: SCOTLAND AND BORDER COUNTIES 1891

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54
Scotland	97.2	97.6	97.3	98.3	108.8	115.4	109.6	108.7	110.8	115.7	119.8
Berwick	94.4	94.4	101.6	94.4	116.4	126.1	132.6	114.5	121.1	121.0	121.3
Peebles	97.4	89.9	103.6	109.1	136.2	147.2	131.9	123.8	135.3	110.2	111.8
Roxburgh	97.7	94.0	102.1	104.8	141.9	146.0	123.6	127.2	123.3	129.7	116.9
Selkirk	99.9	100.2	94.7	103.8	133.5	156.7	124.5	119.8	132.2	116.0	124.4

	55-59	60-64	65-69	70-74	75-79	80-84	85+
Sc.	123.1	129.0	134.9	144.5	150.6	166.0	181.4
Be.	113.1	134.9	110.2	113.8	158.9	151.3	192.3
Pe.	108.1	115.8	112.7	112.3	141.3	85.7	78.6
Ro.	123.9	116.0	112.8	125.5	141.1	149.5	133.3
Se.	135.9	111.3	118.1	128.3	130.6	130.8	116.7

Source: Calculated from Census of Scotland, 1891.

TABLE III.7: AGE-SPECIFIC SEX RATIOS: SCOTLAND AND BORDER COUNTIES 1921

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54
Scotland	98.0	98.8	98.7	100.2	111.3	118.2	118.0	115.9	111.5	104.3	104.9
Berwick	95.0	97.2	96.6	99.9	116.0	121.3	122.7	117.5	119.8	108.5	105.7
Peebles	100.9	102.4	92.8	110.8	131.1	144.8	138.9	144.8	129.9	123.6	127.8
Roxburgh	94.5	96.5	97.5	115.5	130.7	143.4	141.3	139.7	143.5	124.6	132.6
Selkirk	89.4	106.0	101.1	109.0	133.7	150.4	145.0	144.7	134.4	134.9	123.9

	55-59	60-64	65-69	70-74	75-79	80-84	85+
Sc.	107.9	112.5	117.0	140.0	156.8	181.6	
Be.	116.1	126.3	108.1	130.3	119.4	155.7	
Pe.	140.4	140.0	143.4	136.9	157.3	144.7	
Ro.	126.7	129.9	123.8	130.2	139.7	122.4	
Se.	130.7	118.5	115.2	143.9	134.4	150.8	

Source: Calculated from Census of Scotland, 1921.

TABLE III.8: AGE-SPECIFIC SEX RATIOS: SCOTLAND AND BORDER COUNTIES 1951

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54
Scotland	95.0	96.5	97.5	109.0	111.2	103.6	107.7	107.4	105.6	107.2	117.9
Berwick	99.4	97.4	91.3	102.8	101.1	87.4	99.5	103.8	99.0	107.0	112.6
Peebles	91.7	89.8	103.9	118.1	102.8	102.0	110.7	113.3	107.3	123.4	128.5
Roxburgh	90.1	90.4	95.1	114.8	120.0	97.8	99.1	105.6	104.8	114.2	123.0
Selkirk	97.3	90.6	94.2	130.1	129.3	107.8	110.0	110.2	107.1	111.3	125.3

	55-59	60-64	65-69	70-74	75-79	80-84	85+
Sc.	125.2	129.5	130.9	130.3	135.1	157.2	211.2
Be.	124.9	123.4	123.1	126.6	127.3	143.6	268.8
Pe.	147.6	148.6	141.9	142.3	154.1	195.7	165.6
Ro.	140.3	143.0	142.9	149.0	147.2	164.7	272.3
Se.	141.1	156.2	149.4	149.9	160.4	126.0	225.0

Source: Calculated from Census of Scotland, 1951.

TABLE III.9: AGE-SPECIFIC SEX RATIOS: SCOTLAND AND BORDER COUNTIES 1961

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54
Scotland	95.4	95.6	95.2	99.7	109.0	103.1	104.3	103.7	109.1	109.1	108.3
Berwick	92.4	92.1	94.0	88.3	96.4	107.7	102.4	105.7	103.3	107.9	106.4
Peebles	110.4	87.5	84.2	93.1	127.7	105.2	101.3	114.4	98.3	123.3	110.7
Roxburgh	93.8	90.5	88.8	87.7	103.6	105.7	104.7	102.3	104.2	111.9	109.9
Selkirk	83.6	95.4	102.5	105.4	127.3	123.6	108.1	108.0	113.5	118.5	111.2

	55-59	60-64	65-69	70-74	75-79	80-84	85+
Sc.	112.2	129.4	145.2	155.5	162.0	166.6	200.8
Be.	110.6	126.3	126.6	133.3	135.1	162.6	211.3
Pe.	129.9	140.8	166.2	162.2	173.0	178.8	225.0
Ro.	122.3	136.0	159.8	167.3	171.2	176.5	225.0
Se.	115.1	129.6	163.1	172.8	162.0	182.3	277.3

Source: Calculated from Census of Scotland, 1961.

TABLE IV.1: CRUDE BIRTH RATE (i.e. BIRTH RATE PER 1,000 POPULATION): SCOTLAND AND BORDER COUNTIES 1861-1960

	1861-70	1871-80	1881-90	1891-1900	1901-10	1911-20	1921-30	1931-50	1951-60
Scotland	35.0	34.9	32.3	30.2	28.4	24.1	21.5	18.3	18.5
Berwick	31.6	28.8	26.1	23.7	20.8	17.8	17.2	15.0	13.3
Peebles	33.4	31.4	27.1	23.8	20.4	15.3	14.9	13.9	14.9
Roxburgh	31.9	32.5	27.8	21.9	20.4	17.1	15.8	14.7	15.1
Selkirk	37.3	37.0	28.0	22.7	20.5	15.6	15.3	13.9	15.1

Source: Annual Reports of the Registrar-General for Scotland.

TABLE IV.2: CRUDE DEATH RATE (i.e. DEATH RATE PER 1,000 POPULATION): SCOTLAND AND BORDER COUNTIES 1861-1960

	1861-70	1871-80	1881-90	1891-1900	1901-10	1911-20	1921-30	1931-50	1951-60
Scotland	22.1	21.6	19.2	18.5	16.6	15.3	13.7	13.3	12.1
Berwick	16.3	16.4	15.3	15.5	13.7	13.6*	13.9	14.2*	14.1
Peebles	17.1	16.3	13.9	14.4	12.5	12.6*	12.1	13.0*	14.1
Roxburgh	18.4	18.5	16.8	15.8	15.7	14.6*	14.1	13.8*	14.1
Selkirk	19.6	19.6	14.7	14.3	14.6	13.3*	13.5	14.0*	14.9

* adjusted for war losses.
Source: Annual Reports of the Registrar-General for Scotland.

TABLE IV.3: NATURAL INCREASE (N.I.), INTERCENSAL CHANGE (I.C.) and NET MIGRATION (N.M.): BORDER COUNTIES 1861-1960

	Berwick			Peebles			Roxburgh			Selkirk		
	N.I.	I.C.	N.M.	N.I.	I.C.	N.M.	N.I.	I.C.	N.M.	N.I.	I.C.	N.M.
1861-1870	5591	- 127	-5718	1894	922	- 972	7472	- 145	-7617	1989	3556	+1567
1871-1880	4507	-1094	-5601	1916	1492	- 424	6814	- 532	-7346	3913	11,559	+7646
1881-1890	3711	-2986	-6697	1892	939	- 953	5936	299	-5637	3833	1789	-2044
1891-1900	2551	-1582	-4133	1422	305	-1117	3215	-4937	-8152	2338	-3997	-6335
1901-1910	2134	-1181	-3315	1197	192	-1005	2242	-1612	-3854	1315	1245	- 70
1911-1920	1219	-1397	-2200*	420	74	- 100*	1130	-2203	-2700*	534	-1994	-2200*
1921-1930	898	-1634	-2532	418	- 281	- 699	763	799	+ 36	409	1	- 408
1931-1950	404	-1544	-1800*	213	181	- 100*	753	- 231	- 500*	- 32	- 879	- 600*
1951-1960	-211	-2631	-2420	112	-1076	-1188	513	-2374	-2887	72	- 677	- 749

* adjusted for war losses.
Source: Annual Reports of the Registrar-General for Scotland and Censuses of Scotland.

TABLE IV.4: RATE OF NATURAL INCREASE (i.e. BIRTH RATE MINUS DEATH RATE): SCOTLAND AND BORDER COUNTIES 1861-1960

	1861-70	1871-80	1881-90	1891-1900	1901-10	1911-20	1921-30	1931-50	1951-60
Scotland	12.9	13.3	13.1	11.7	11.8	8.8	7.8	5.0	6.4
Berwick	15.3	12.4	10.8	8.2	7.1	4.2	3.3	0.8	-0.8
Peebles	16.3	15.1	13.2	9.4	7.9	2.7	2.8	0.7	0.8
Roxburgh	13.5	14.0	13.0	6.1	4.7	2.5	1.7	0.9	1.0
Selkirk	17.7	17.4	13.3	8.4	5.9	2.3	1.8	-0.1	0.2

Source: Calculated from the Annual Reports of the Registrar-General for Scotland.

TABLE IV.5: AVERAGE ANNUAL MIGRATION RATE PER 1,000 of PREVIOUS CENSUS POPULATION

	1861-70	1871-80	1881-90	1891-1900	1901-10	1911-20	1921-30	1931-50	1951-60
Berwick	-15.6	-15.4	-18.9	-12.8	-10.8	-7.4	-9.0	-3.4	-9.7
Peebles	- 8.5	- 3.4	- 6.9	- 7.6	- 6.7	-0.7	-4.6	-0.3	-7.8
Roxburgh	-14.1	-13.6	-10.6	-15.2	- 7.9	-5.7	+0.1	-0.5	-6.3
Selkirk	+15.0	+54.6	- 8.0	-23.2	- 0.3	-8.9	-1.8	-1.3	-3.5

Source: Calculated from Annual Reports of the Registrar-General for Scotland.

TABLE IV.6: SUMMARY OF IN-MIGRATION: RESIDENTS OF BERWICK BY PLACE OF BIRTH 1861, 1891, 1921 and 1961

	Berwick County	Scotland outside Berwick	Scotland Total	England	Ireland	Wales	Elsewhere	Total
1861	26,358 (72.24%)	7,392 (20.26%)	33,750 (92.50%)	2,164 (5.93%)	454 (1.24%)	4 (0.01%)	116 (0.32%)	36,488 (100%)
1891	23,241 (71.98%)	6,813 (21.09%)	30,054 (93.08%)	1,878 (5.82%)	199 (0.62%)	1 (0.00%)	158 (0.49%)	32,290 (100%)
1921	17,243 (61.05%)	8,098 (28.66%)	25,341 (89.71%)	2,521 (8.93%)	205 (0.73%)	15 (0.05%)	164 (0.58%)	28,246 (100%)
1961	11,021 (49.12%)	8,089 (36.05%)	19,110 (85.17%)	2,769 (12.34%)	207 (0.91%)	27 (0.12%)	351 (1.56%)	22,437 (100%)

Source: Census of Scotland: Birthplace Tables.

TABLE IV.7: SUMMARY OF IN-MIGRATION:
RESIDENTS OF PEEBLES BY PLACE OF BIRTH 1861, 1891, 1921 and 1961

	Peebles County	Scotland outside Peebles	Scotland Total	England	Ireland	Wales	Elsewhere	Total
1861	6,289 (55.65%)	4,460 (39.47%)	10,749 (95.12%)	150 (1.33%)	357 (3.16%)	1 (0.00%)	43 (0.38%)	11,300 (100%)
1891	7,070 (47.93%)	6,991 (47.40%)	14,061 (95.33%)	379 (2.57%)	212 (1.44%)	10 (0.07%)	88 (0.60%)	14,750 (100%)
1921	6,295 (41.06%)	7,947 (51.83%)	14,242 (92.89%)	750 (4.89%)	161 (1.05%)	23 (0.15%)	156 (1.03%)	15,332 (100%)
1961	5,487 (38.76%)	7,162 (50.59%)	12.649 (89.35%)	974 (6.88%)	131 (0.93%)	30 (0.21%)	372 (2.63%)	14,156 (100%)

Source: Census of Scotland — Birthplace Tables.

TABLE IV.8: SUMMARY OF IN-MIGRATION:
RESIDENTS OF ROXBURGH BY PLACE OF BIRTH 1861, 1891, 1921 and 1961

	Roxburgh County	Scotland outside Roxburgh	Scotland Total	England	Ireland	Wales	Elsewhere	Total
1861	36,214 (67.41%)	12,149 (22.61%)	48,363 (90.02%)	2,975 (5.54%)	2,115 (3.94%)	64 (0.11%)	205 (0.38%)	53,722 (100%)
1891	36,791 (68.77%)	13.052 (24.40%)	49,843 (93.16%)	2,837 (5.30%)	552 (1.03%)	16 (0.03%)	252 (0.47%)	53,500 (100%)
1921	28,345 (63.01%)	12,674 (28.17%)	41,019 (91.18%)	3,340 (7.42%)	285 (0.63%)	35 (0.08%)	310 (0.69%)	44,989 (100%)
1961	23,687 (54.85%)	14,136 (32.74%)	37,823 (87.59%)	4,203 (9.73%)	368 (0.85%)	77 (0.18%)	699 (1.62%)	43,183 (100%)

Source: Census of Scotland — Birthplace Tables.

TABLE IV.9: SUMMARY OF IN-MIGRATION:
RESIDENTS OF SELKIRK BY PLACE OF BIRTH 1861, 1891, 1921 and 1961

	Selkirk County	Scotland outside Selkirk	Scotland Total	England	Ireland	Wales	Elsewhere	Total
1861	5,249 (50.42%)	4,624 (44.42%)	9,873 (94.84%)	223 (2.14%)	266 (2.56%)	3 (0.03%)	45 (0.43%)	10,410 (100%)
1891	11,849 (42.75%)	14,592 (52.66%)	26,441 (95.41%)	782 (2.82%)	366 (1.32%)	15 (0.05%)	108 (0.39%)	27,712 (100%)
1921	12,051 (53.31%)	9,123 (40.35%)	21,174 (93.66%)	1,071 (4.74%)	165 (0.73%)	25 (0.11%)	172 (0.76%)	22,607 (100%)
1961	10.850 (51.54%)	8,134 (38.64%)	18,984 (90.18%)	1,352 (6.42%)	187 (0.89%)	48 (0.23%)	475 (2.26%)	21,052 (100%)

Source: Census of Scotland — Birthplace Tables.

COUNTY RATIOS OF ACTUAL TO EXPECTED MIGRANTS .....

County	TABLE IV.10: ... for BERWICK 1861					TABLE IV.11: ... for BERWICK 1891					TABLE IV.12: ... for BERWICK 1921					TABLE IV.13: ... for BERWICK 1961				
	Zonal Distance	IN		OUT		Zonal Distance	IN		OUT		Zonal Distance	IN		OUT		Zonal Distance	IN		OUT	
		Male	Female	Male	Female		Male	Female	Male	Female		Male	Female	Male	Female		Male	Female	Male	Female
Aberdeen	4	0.06	0.09	0.08	0.06	4	0.26	0.27	0.10	0.10	4	0.31	0.36	0.16	0.22	4	0.45	0.42	0.22	0.14
Angus	3	0.16	0.18	0.28	0.22	3	0.25	0.20	0.19	0.16	3	0.34	0.29	0.23	0.22	3	0.31	0.31	0.23	0.20
Argyll	5	0.13	0.15	0.15	0.17	5	0.17	0.31	0.20	0.26	5	0.53	0.47	0.33	0.37	5	0.53	0.61	0.39	0.35
Ayr	3	0.31	0.13	0.10	0.13	3	0.21	0.16	0.16	0.12	3	0.30	0.32	0.24	0.20	3	0.24	0.27	0.23	0.20
Banff	4	0.10	0.08	0.15	0.06	4	0.38	0.27	0.11	0.13	4	1.06	1.07	0.22	0.21	4	0.68	0.81	0.07	0.18
Berwick	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bute	4	0.11	0.00	0.11	0.14	4	0.07	0.00	0.34	0.27	4	0.09	0.06	0.18	0.25	4	0.69	0.30	0.72	0.19
Caithness	6	0.35	0.58	0.20	0.22	6	0.52	0.68	0.23	0.18	6	0.94	1.31	0.19	0.36	6	0.66	1.21	0.31	0.18
Clackmannan	2	0.31	0.40	0.49	0.43	2	0.18	0.57	0.56	0.48	2	1.02	1.04	0.53	0.66	2	0.49	0.71	0.55	0.47
Dumfries	3	0.46	0.48	0.34	0.22	3	0.65	0.84	0.42	0.40	3	1.24	1.40	0.61	0.56	3	1.44	1.39	1.19	0.90
Dunbarton	3	0.14	0.18	0.21	0.28	3	0.22	0.27	0.40	0.39	3	0.20	0.20	0.37	0.34	3	0.22	0.13	0.27	0.25
East Lothian*	1	15.80	14.44	9.56	10.93	1	15.45	14.38	9.10	9.47	1	12.02	10.74	12.85	12.19	1	8.07	8.46	12.49	10.57
Fife	2	0.32	0.52	0.41	0.40	2	0.89	0.79	0.45	0.48	2	0.54	0.67	0.71	0.69	2	0.42	0.51	0.66	0.49
Inverness	5	0.27	0.46	0.07	0.02	5	0.27	0.74	0.11	0.03	5	0.27	0.57	0.38	0.33	5	0.33	0.66	0.49	0.51
Kincardine	3	0.26	0.34	0.08	0.06	3	1.45	0.65	0.12	0.10	3	1.31	0.73	0.19	0.15	3	0.30	0.32	0.23	0.16
Kinross	2	0.31	0.38	0.61	0.54	2	0.82	0.85	1.04	0.84	2	1.15	1.66	1.49	0.93	2	1.80	1.64	1.63	1.28
Kirkcudbright	3	0.22	0.19	0.22	0.23	3	0.45	0.35	0.37	0.29	3	1.00	0.77	0.33	0.60	3	1.11	1.19	0.64	0.82
Lanark	3	0.14	0.16	0.32	0.34	3	0.13	0.15	0.36	0.33	3	0.16	0.24	0.25	0.24	3	0.21	0.25	0.19	0.15
Midlothian*	2	1.98	2.10	3.65	3.61	2	1.41	1.49	3.20	2.91	2	1.70	1.72	3.12	3.03	2	2.51	2.35	2.42	2.23
Moray	5	0.30	0.31	0.10	0.07	5	0.27	0.37	0.20	0.12	5	0.46	0.69	0.25	0.16	5	0.40	0.56	0.41	0.31
Nairn	5	0.08	0.07	0.27	0.09	5	0.13	0.11	0.05	0.09	5	0.48	0.36	0.24	0.12	5	0.49	0.00	0.13	0.27
Orkney	7	0.11	0.07	0.26	0.11	7	0.04	0.38	0.13	0.08	7	0.61	0.68	0.11	0.14	7	0.93	1.38	0.29	0.21
Peebles	2	3.93	3.66	3.54	2.73	2	2.29	3.44	4.64	4.57	2	7.77	4.31	6.42	5.98	2	8.91	5.69	7.02	6.54
Perth	3	0.38	0.43	0.24	0.34	3	0.85	0.83	0.30	0.35	3	0.87	0.65	0.77	0.68	3	0.72	0.67	0.93	0.65
Renfrew	3	0.09	0.06	0.20	0.13	3	0.10	0.07	0.14	0.15	3	0.19	0.19	0.18	0.19	3	0.10	0.15	0.19	0.16
Ross & Cromarty	6	0.15	0.16	0.05	0.07	6	0.13	0.27	0.08	0.06	6	0.32	0.51	0.15	0.14	6	0.28	0.47	0.36	0.25
Roxburgh*	1	18.89	22.44	16.54	17.21	1	31.79	27.67	16.66	17.32	1	30.65	30.62	22.50	19.98	1	24.98	22.54	28.67	21.06
Selkirk	1	7.40	9.94	8.93	9.13	1	5.89	4.73	15.19	16.21	1	12.64	9.74	14.77	14.05	1	29.00	23.61	17.26	16.11
Stirling	3	0.40	0.30	0.32	0.23	3	0.21	0.37	0.50	0.44	3	0.31	0.47	0.53	0.45	3	0.26	0.45	0.39	0.31
Sutherland	6	0.21	0.17	0.07	0.04	6	0.23	0.34	0.15	0.02	6	0.44	1.31	0.29	0.13	6	1.79	1.56	0.00	0.29
West Lothian	2	0.62	0.51	0.80	0.77	2	0.70	0.90	0.65	0.67	2	0.56	0.88	0.86	0.89	2	0.82	1.01	1.03	0.71
Wigtown	4	0.25	0.17	0.08	0.12	4	0.36	0.44	0.24	0.29	4	0.53	0.56	0.33	0.41	4	1.46	1.06	0.56	0.38
Zetland	7	0.00	0.23	0.08	0.07	7	0.00	0.20	0.11	0.05	7	0.76	0.41	0.03	0.13	7	0.46	0.61	0.44	0.13

* contiguous counties.

Source: Calculated from the Census of Scotland — Birthplace Tables, 1861, 1891, 1921, 1961.

COUNTY RATIOS OF ACTUAL TO EXPECTED MIGRANTS .....

TABLE IV.14:... FOR PEEBLES 1861

County	Zonal Distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	4	0.11	0.07	0.04	0.06
Angus	3	0.18	0.12	0.06	0.08
Argyll	4	0.35	0.27	0.35	0.24
Ayr	2	0.16	0.20	0.09	0.14
Banff	5	0.05	0.13	0.03	0.01
Berwick	2	3.05	2.25	1.47	1.23
Bute	3	0.00	0.38	0.19	0.00
Caithness	6	0.14	0.03	0.09	0.04
Clackmannan	2	0.46	0.87	0.62	0.56
Dumfries*	2	1.77	1.75	0.86	0.69
Dunbarton	2	0.13	0.07	0.25	0.25
East Lothian	1	1.64	1.90	1.98	2.04
Fife	2	0.47	0.65	0.28	0.29
Inverness	4	0.12	0.10	0.13	0.04
Kincardine	4	0.20	0.08	0.05	0.05
Kinross	2	0.54	0.82	0.24	0.11
Kirkcudbright	2	0.21	0.39	0.39	0.33
Lanark*	1	1.29	1.50	0.96	0.93
Midlothian*	1	3.34	2.94	5.94	6.01
Moray	5	0.17	0.12	0.11	0.06
Nairn	5	0.14	0.00	0.10	0.08
Orkney	7	0.09	0.31	0.09	0.10
Peebles	-	-	-	-	-
Perth	3	0.36	0.34	0.30	0.25
Renfrew	2	0.17	0.14	0.18	0.11
Ross & Cromarty	6	0.16	0.17	0.10	0.09
Roxburgh	1	4.85	5.21	2.52	2.70
Selkirk*	1	28.56	26.11	13.41	14.40
Stirling	2	0.33	0.42	0.41	0.28
Sutherland	6	0.12	0.25	0.20	0.19
West Lothian	1	0.72	0.73	1.06	1.40
Wigtown	3	0.35	0.27	0.14	0.06
Zetland	7	0.21	0.04	0.11	0.02

TABLE IV.15:...FOR PEEBLES 1891

County	Zonal Distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	4	0.19	0.20	0.07	0.06
Angus	3	0.19	0.16	0.16	0.15
Argyll	4	0.20	0.35	0.35	0.27
Ayr	2	0.34	0.44	0.22	0.21
Banff	5	0.26	0.37	0.07	0.09
Berwick	2	5.03	4.48	0.86	1.48
Bute	3	0.00	0.05	0.44	0.36
Caithness	6	0.36	0.52	0.00	0.05
Clackmannan	2	2.45	2.57	1.20	1.21
Dumfries*	2	2.47	2.76	1.28	0.93
Dunbarton	2	0.08	0.08	0.36	0.41
East Lothian	1	4.84	4.00	2.53	2.75
Fife	2	0.53	0.50	0.34	0.44
Inverness	4	0.30	0.29	0.12	0.06
Kincardine	4	0.42	0.18	0.12	0.03
Kinross	2	2.31	0.97	1.73	1.11
Kirkcudbright	2	0.72	0.51	0.92	0.67
Lanark*	1	0.92	1.07	0.87	0.84
Midlothian*	1	2.26	2.26	4.05	4.13
Moray	5	0.30	0.35	0.20	0.11
Nairn	5	0.00	0.60	0.33	0.10
Orkney	7	0.09	0.23	0.04	0.03
Peebles	-	-	-	-	-
Perth	3	0.65	0.55	0.37	0.37
Renfrew	2	0.08	0.13	0.20	0.14
Ross & Cromarty	6	0.32	0.18	0.06	0.09
Roxburgh	1	7.48	5.62	2.83	2.59
Selkirk*	1	12.97	10.07	11.67	13.83
Stirling	2	0.58	0.63	0.58	0.47
Sutherland	6	0.12	0.46	0.20	0.09
West Lothian	1	1.34	1.44	1.34	1.60
Wigtown	3	0.44	0.22	0.24	0.16
Zetland	7	0.00	0.23	0.04	0.06

TABLE IV.16:... FOR PEEBLES 1921

County	Zonal Distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	4	0.25	0.32	0.13	0.17
Angus	3	0.30	0.33	0.24	0.17
Argyll	4	0.68	0.45	0.46	0.30
Ayr	2	0.36	0.39	0.33	0.28
Banff	5	0.33	0.55	0.12	0.02
Berwick	2	7.13	6.38	3.98	2.83
Bute	3	0.20	0.14	0.46	0.46
Caithness	6	0.62	0.74	0.09	0.13
Clackmannan	2	2.86	2.94	1.15	0.85
Dumfries*	2	2.67	4.40	1.37	1.16
Dunbarton	2	0.25	0.28	0.45	0.55
East Lothian	1	3.72	4.01	3.58	3.38
Fife	2	0.48	0.49	0.66	0.68
Inverness	4	0.51	0.58	0.16	0.11
Kincardine	4	0.42	0.58	0.06	0.06
Kinross	2	0.72	0.80	1.66	1.11
Kirkcudbright	2	1.26	1.07	1.04	0.91
Lanark*	1	0.64	0.69	0.77	0.71
Midlothian*	1	2.55	2.34	3.42	3.61
Moray	5	0.76	0.96	0.40	0.29
Nairn	5	0.35	0.34	0.32	0.14
Orkney	7	0.42	0.43	0.11	0.10
Peebles	-	-	-	-	-
Perth	3	0.85	0.87	0.79	0.91
Renfrew	2	0.20	0.21	0.27	0.27
Ross & Cromarty	6	0.25	0.38	0.23	0.14
Roxburgh	1	8.21	6.26	4.06	4.35
Selkirk*	1	22.46	17.81	12.66	12.81
Stirling	2	0.67	0.66	0.68	0.87
Sutherland	6	0.24	0.54	0.22	0.50
West Lothian	1	0.90	1.32	2.32	1.22
Wigtown	3	1.21	0.94	0.35	0.48
Zetland	7	0.12	0.12	0.33	0.00

TABLE IV.17:... FOR PEEBLES 1961

County	Zonal Distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	4	0.41	0.37	0.20	0.24
Angus	3	0.24	0.32	0.25	0.28
Argyll	4	0.74	0.79	0.71	0.83
Ayr	2	0.48	0.43	0.58	0.40
Banff	5	0.42	0.62	0.25	0.18
Berwick	2	6.20	7.17	7.60	5.20
Bute	3	0.47	0.56	0.14	0.62
Caithness	6	0.62	0.30	0.33	0.26
Clackmannan	2	0.77	1.11	0.60	0.62
Dumfries*	2	2.83	2.38	1.79	1.60
Dunbarton	2	0.26	0.18	0.40	0.59
East Lothian	1	2.92	3.01	3.45	3.68
Fife	2	0.47	0.55	0.74	0.65
Inverness	4	0.55	0.79	0.40	0.44
Kincardine	4	0.30	0.27	0.16	0.24
Kinross	2	1.20	0.59	1.42	1.02
Kirkcudbright	2	1.88	1.46	1.31	1.49
Lanark*	1	0.58	0.62	0.72	0.66
Midlothian*	1	3.08	2.84	2.52	2.92
Moray	5	0.22	0.39	0.49	0.32
Nairn	5	0.78	0.61	0.46	0.00
Orkney	7	0.68	0.78	0.00	0.09
Peebles	-	-	-	-	-
Perth	3	0.93	0.84	1.14	0.88
Renfrew	2	0.16	0.19	0.27	0.28
Ross & Cromarty	6	0.55	0.62	0.56	0.42
Roxburgh	1	7.06	5.95	6.33	6.42
Selkirk*	1	16.35	16.80	19.64	15.85
Stirling	2	0.57	0.55	0.58	0.65
Sutherland	6	0.24	0.59	0.70	0.64
West Lothian	1	1.01	1.01	1.12	1.17
Wigtown	3	1.25	0.92	0.39	0.54
Zetland	7	0.64	0.88	0.11	0.10

* contiguous counties.

Source: Calculated from 1861, 1891, 1921 and 1961 Censuses of Scotland — Birthplace Tables.

COUNTY RATIOS OF ACTUAL TO EXPECTED MIGRANTS .....

TABLE IV.18: ... FOR ROXBURGH 1861

County	Zonal distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	5	0.15	0.12	0.08	0.07
Angus	3	0.14	0.14	0.17	0.13
Argyll	4	0.06	0.20	0.40	0.37
Ayr	3	0.20	0.21	0.18	0.11
Banff	5	0.17	0.15	0.07	0.03
Berwick*	1	19.82	25.28	17.68	19.14
Bute	4	0.03	0.11	0.20	0.36
Caithness	6	0.18	0.24	0.30	0.28
Clackmannan	3	0.81	0.95	1.09	0.88
Dumfries*	1	4.40	5.35	2.34	1.90
Dunbarton	3	0.06	0.21	0.21	0.24
East Lothian	2	2.08	2.34	2.15	1.93
Fife	2	0.32	0.37	0.26	0.30
Inverness	5	0.51	0.17	0.21	0.16
Kincardine	4	0.18	0.10	0.04	0.08
Kinross	3	0.37	0.37	0.19	0.17
Kirkcudbright	3	0.69	0.57	0.62	0.44
Lanark	2	0.19	0.18	0.36	0.31
Midlothian*	2	1.34	1.63	2.90	3.11
Moray	5	0.25	0.29	0.29	0.19
Nairn	5	0.42	0.39	0.20	0.31
Orkney	7	0.04	0.12	0.05	0.03
Peebles	1	5.24	7.29	8.15	8.59
Perth	3	0.48	0.47	0.30	0.29
Renfrew	3	0.14	0.11	0.19	0.13
Ross & Cromarty	6	0.39	0.18	0.31	0.24
Roxburgh	-	-	-	-	-
Selkirk*	1	35.01	47.36	50.61	52.59
Stirling	3	0.37	0.42	0.35	0.41
Sutherland	6	0.35	0.17	0.50	0.23
West Lothian	2	0.37	0.67	0.34	0.56
Wigtown	3	0.21	0.28	0.32	0.20
Zetland	7	0.00	0.10	0.06	0.01

TABLE IV.19: ... FOR ROXBURGH 1891

County	Zonal distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	5	0.20	0.20	0.07	0.06
Angus	3	0.21	0.17	0.13	0.13
Argyll	4	0.31	0.39	0.21	0.19
Ayr	3	0.29	0.35	0.22	0.16
Banff	5	0.30	0.34	0.09	0.05
Berwick*	1	35.79	32.19	15.84	16.14
Bute	4	0.25	0.22	0.34	0.34
Caithness	6	0.31	0.53	0.08	0.08
Clackmannan	3	1.54	1.31	0.95	0.92
Dumfries*	1	9.44	10.13	1.75	1.82
Dunbarton	3	0.08	0.10	0.20	0.24
East Lothian	2	3.02	2.56	2.41	2.06
Fife	2	0.51	0.46	0.36	0.36
Inverness	5	0.32	0.41	0.18	0.13
Kincardine	4	0.21	0.29	0.15	0.11
Kinross	3	1.15	1.34	0.76	0.47
Kirkcudbright	3	1.35	1.05	0.83	0.83
Lanark	2	0.17	0.17	0.34	0.26
Midlothian*	2	1.18	1.18	2.34	2.15
Moray	5	0.37	0.58	0.11	0.13
Nairn	5	0.44	0.36	0.44	0.25
Orkney	7	0.07	0.39	0.04	0.04
Peebles	1	6.79	5.01	8.17	7.44
Perth	3	0.79	0.54	0.29	0.27
Renfrew	3	0.11	0.09	0.13	0.11
Ross & Cromarty	6	0.28	0.34	0.11	0.09
Roxburgh	-	-	-	-	-
Selkirk*	1	18.50	16.08	47.98	51.29
Stirling	3	0.56	0.61	0.37	0.38
Sutherland	6	0.33	0.55	0.29	0.13
West Lothian	2	0.46	0.80	0.70	0.49
Wigtown	3	0.46	0.52	0.15	0.12
Zetland	7	0.08	0.13	0.02	0.11

TABLE IV.20: ... FOR ROXBURGH 1921

County	Zonal distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	5	0.33	0.30	0.14	0.15
Angus	3	0.44	0.32	0.20	0.22
Argyll	4	0.36	0.59	0.25	0.32
Ayr	3	0.29	0.36	0.29	0.28
Banff	5	0.60	0.70	0.12	0.03
Berwick*	1	46.02	38.93	23.80	23.16
Bute	4	0.19	0.14	0.30	0.40
Caithness	6	0.39	1.14	0.10	0.12
Clackmannan	3	1.37	1.11	0.90	0.85
Dumfries*	1	6.31	7.23	2.31	2.17
Dunbarton	3	0.15	0.17	0.48	0.51
East Lothian	2	2.79	2.96	3.28	3.57
Fife	2	0.54	0.55	0.64	0.63
Inverness	5	0.37	0.51	0.39	0.32
Kincardine	4	0.39	0.49	0.14	0.12
Kinross	3	1.69	1.67	1.01	1.00
Kirkcudbright	3	1.89	1.19	1.47	1.21
Lanark	2	0.18	0.22	0.33	0.31
Midlothian*	2	1.53	1.49	3.29	2.95
Moray	5	0.38	0.68	0.32	0.17
Nairn	5	0.76	0.86	0.26	0.38
Orkney	7	0.38	0.65	0.09	0.02
Peebles	1	7.53	6.56	9.05	8.58
Perth	3	0.93	0.85	0.64	0.61
Renfrew	3	0.19	0.16	0.24	0.21
Ross & Cromarty	6	0.54	0.57	0.18	0.04
Roxburgh	-	-	-	-	-
Selkirk*	1	32.33	24.94	28.85	30.85
Stirling	3	0.37	0.46	0.63	0.55
Sutherland	6	0.60	0.90	0.09	0.08
West Lothian	2	0.58	0.88	0.80	0.86
Wigtown	3	0.99	0.82	0.32	0.33
Zetland	7	0.04	0.35	0.09	0.02

TABLE IV.21: ... FOR ROXBURGH 1961

County	Zonal distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	5	0.38	0.33	0.26	0.20
Angus	3	0.33	0.35	0.30	0.35
Argyll	4	0.55	0.59	0.75	0.63
Ayr	3	0.29	0.31	0.42	0.40
Banff	5	0.58	0.82	0.16	0.26
Berwick*	1	38.58	36.12	31.31	27.78
Bute	4	0.52	0.12	0.53	0.42
Caithness	6	0.39	0.75	0.35	0.29
Clackmannan	3	0.45	0.43	0.93	0.80
Dumfries*	1	3.43	3.79	3.63	3.05
Dunbarton	3	0.17	0.19	0.42	0.39
East Lothian	2	3.13	2.81	3.92	3.90
Fife	2	0.52	0.55	0.76	0.67
Inverness	5	0.48	0.64	0.43	0.23
Kincardine	4	0.23	0.22	0.17	0.08
Kinross	3	1.64	2.14	1.87	1.15
Kirkcudbright	3	1.84	1.74	1.05	1.04
Lanark	2	0.28	0.28	0.25	0.25
Midlothian*	2	2.14	1.99	2.37	2.65
Moray	5	0.12	0.44	0.32	0.35
Nairn	5	0.38	1.19	0.11	0.27
Orkney	7	0.42	1.03	0.05	0.16
Peebles	1	8.14	7.71	12.28	10.45
Perth	3	0.67	0.73	0.80	0.74
Renfrew	3	0.18	0.18	0.23	0.27
Ross & Cromarty	6	0.33	0.73	0.37	0.21
Roxburgh	-	-	-	-	-
Selkirk*	1	43.73	39.12	34.17	34.09
Stirling	3	0.44	0.49	0.59	0.58
Sutherland	6	0.46	1.13	0.46	0.29
West Lothian	2	0.98	1.11	0.94	0.89
Wigtown	3	1.20	1.40	0.73	0.35
Zetland	7	0.31	0.57	0.15	0.04

* contiguous counties.

Source: Calculated from 1861, 1891, 1921 and 1961 Censuses of Scotland — Birthplace Tables.

COUNTY RATIOS OF ACTUAL TO EXPECTED MIGRANTS .....

County	TABLE IV.22: ... FOR SELKIRK 1861					TABLE IV.23: ... FOR SELKIRK 1891				
	Zonal distance	IN Male	IN Female	OUT Male	OUT Female	Zonal distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	4	0.05	0.03	0.02	0.04	4	0.14	0.18	0.09	0.10
Angus	3	0.10	0.07	0.04	0.05	3	0.15	0.11	0.08	0.07
Argyll	4	0.10	0.08	0.22	0.16	4	0.11	0.17	0.43	0.21
Ayr	3	0.09	0.14	0.08	0.09	3	0.16	0.17	0.24	0.15
Banff	5	0.02	0.08	0.05	0.05	5	0.23	0.43	0.10	0.18
Berwick	1	6.70	6.76	3.87	5.15	1	14.42	16.91	5.94	5.41
Bute	4	0.00	0.07	0.59	0.32	4	0.07	0.06	0.64	0.15
Caithness	6	0.07	0.15	0.26	0.14	6	0.32	0.39	0.00	0.04
Clackmannan	2	2.40	2.00	0.48	0.73	2	2.48	2.88	2.02	1.47
Dumfries*	2	3.19	3.23	1.29	1.26	2	2.19	2.63	1.99	1.52
Dunbarton	3	0.03	0.00	0.14	0.14	3	0.02	0.08	0.33	0.35
East Lothian	1	1.70	1.37	1.07	1.34	1	2.07	2.56	1.88	2.09
Fife	2	0.40	0.41	0.17	0.21	2	0.34	0.38	0.47	0.29
Inverness	5	0.16	0.13	0.14	0.06	5	0.13	0.28	0.26	0.03
Kincardine	4	0.08	0.00	0.00	0.04	4	0.18	0.20	0.04	0.08
Kinross	2	1.39	0.47	0.37	0.35	2	1.19	1.38	3.02	2.70
Kirkcudbright	3	0.07	0.06	0.14	0.13	3	0.62	0.57	0.75	0.53
Lanark	2	0.14	0.15	0.22	0.16	2	0.13	0.19	0.37	0.33
Midlothian*	1	1.43	1.43	2.72	2.66	1	1.08	1.25	2.42	2.58
Moray	5	0.20	0.06	0.18	0.03	5	0.25	0.42	0.33	0.13
Nairn	5	0.14	0.12	0.15	0.14	5	0.19	0.11	0.16	0.00
Orkney	7	0.00	0.04	0.00	0.00	7	0.02	0.15	0.05	0.00
Peebles*	1	17.33	20.04	26.82	26.09	1	12.37	15.04	17.92	26.15
Perth	3	0.41	0.26	0.21	0.15	3	0.36	0.34	0.39	0.48
Renfrew	3	0.09	0.05	0.08	0.06	3	0.10	0.08	0.18	0.22
Ross & Cromarty	6	0.12	0.14	0.19	0.14	6	0.09	0.13	0.18	0.11
Roxburgh*	1	26.24	28.70	23.44	26.52	1	38.44	41.23	20.68	22.03
Selkirk	-	-	-	-	-	-	-	-	-	-
Stirling	2	0.32	0.34	0.28	0.14	2	0.62	0.62	0.62	0.42
Sutherland	6	0.06	0.19	0.43	0.21	6	0.28	0.35	0.14	0.19
West Lothian	2	0.23	0.28	0.29	0.08	2	0.27	0.76	0.96	0.72
Wigtown	4	0.14	0.12	0.33	0.23	4	0.16	0.40	0.35	0.16
Zetland	7	0.00	0.00	0.00	0.00	7	0.02	0.07	0.00	0.09

County	TABLE IV.24: ... FOR SELKIRK 1921					TABLE IV.25: ... FOR SELKIRK 1961				
	Zonal distance	IN Male	IN Female	OUT Male	OUT Female	Zonal distance	IN Male	IN Female	OUT Male	OUT Female
Aberdeen	4	0.34	0.30	0.18	0.14	4	0.38	0.41	0.14	0.17
Angus	3	0.21	0.21	0.19	0.28	3	0.30	0.25	0.25	0.22
Argyll	4	0.25	0.34	0.24	0.21	4	0.32	0.47	0.51	0.38
Ayr	3	0.24	0.29	0.39	0.27	3	0.34	0.28	0.35	0.30
Banff	5	0.48	0.47	0.20	0.35	5	0.76	0.90	0.25	0.37
Berwick	1	20.89	19.42	8.08	7.91	1	20.40	22.93	24.20	21.63
Bute	4	0.04	0.10	0.15	0.30	4	0.21	0.48	0.64	0.76
Caithness	6	0.44	0.78	0.04	0.07	6	0.20	0.78	0.35	0.22
Clackmannan	2	2.97	3.30	1.04	1.13	2	1.33	1.13	0.48	0.69
Dumfries*	2	3.21	3.07	1.91	1.42	2	2.31	2.17	2.05	1.47
Dunbarton	3	0.16	0.17	0.36	0.32	3	0.20	0.16	0.14	0.28
East Lothian	1	2.92	2.90	2.74	2.93	1	2.66	2.51	2.19	2.20
Fife	2	0.49	0.54	0.57	0.59	2	0.46	0.61	0.47	0.56
Inverness	5	0.35	0.45	0.42	0.36	5	0.31	0.53	0.37	0.39
Kincardine	4	0.33	0.46	0.35	0.15	4	0.24	0.26	0.16	0.28
Kinross	2	2.34	1.29	1.26	1.73	2	1.51	1.02	1.50	0.85
Kirkcudbright	3	1.50	0.87	1.00	0.91	3	1.65	1.19	1.08	0.88
Lanark	2	0.21	0.23	0.37	0.31	2	0.30	0.34	0.23	0.22
Midlothian*	1	1.59	1.69	3.14	3.03	1	2.18	2.00	2.19	2.27
Moray	5	0.31	0.56	0.34	0.22	5	0.66	0.60	0.45	0.41
Nairn	5	0.30	0.60	0.27	0.23	5	0.88	0.79	0.61	0.00
Orkney	7	0.21	0.27	0.19	0.00	7	1.30	0.67	0.13	0.12
Peebles*	1	17.59	13.94	25.70	26.21	1	22.18	15.80	18.94	21.92
Perth	3	0.65	0.67	0.69	0.72	3	0.55	0.46	0.71	0.65
Renfrew	3	0.17	0.14	0.35	0.30	3	0.23	0.24	0.26	0.24
Ross & Cromarty	6	0.32	0.38	0.13	0.04	6	0.95	0.79	0.28	0.32
Roxburgh*	1	33.34	29.11	20.07	20.12	1	26.26	25.19	33.29	32.65
Selkirk	-	-	-	-	-	-	-	-	-	-
Stirling	2	0.49	0.65	0.61	0.55	2	0.46	0.51	0.59	0.40
Sutherland	6	0.28	0.37	0.06	0.18	6	0.64	1.10	0.19	0.26
West Lothian	2	0.55	0.57	0.93	0.95	2	0.70	1.03	0.75	0.69
Wigtown	4	1.08	0.85	0.19	0.23	4	1.47	1.19	0.47	0.56
Zetland	7	0.36	0.35	0.32	0.00	7	0.74	0.63	0.14	0.13

*contiguous counties.

Source: Calculated from 1861, 1891, 1921 and 1961 Censuses of Scotland — Birthplace Tables.

TABLE IV.26: MEAN RATIOS OF ACTUAL TO EXPECTED MIGRANTS FOR EACH ZONAL DISTANCE, IN AND OUT: BERWICK 1861, 1891, 1921 and 1961

Zonal distance	IN 1861	IN 1891	IN 1921	IN 1961	OUT 1861	OUT 1891	OUT 1921	OUT 1961
1	14.82	16.65	19.07	19.44	12.05	13.99	16.06	17.69
2	1.25	1.19	1.92	2.24	1.50	1.71	2.11	2.09
3	0.23	0.34	0.56	0.50	0.22	0.28	0.37	0.41
4	0.11	0.26	0.51	0.73	0.10	0.20	0.25	0.31
5	0.22	0.29	0.48	0.45	0.12	0.13	0.27	0.36
6	0.27	0.36	0.81	1.00	0.11	0.12	0.21	0.23
7	0.10	0.11	0.62	0.85	0.13	0.09	0.10	0.27

Source: Derived from Tables IV.10 to IV.25.

TABLE IV.27: MEAN RATIOS OF ACTUAL TO EXPECTED MIGRANTS FOR EACH ZONAL DISTANCE, IN AND OUT: PEEBLES 1861, 1891, 1921 and 1961

Zonal distance	IN 1861	IN 1891	IN 1921	IN 1961	OUT 1861	OUT 1891	OUT 1921	OUT 1961
1	6.57	4.50	5.91	5.10	4.45	4.09	4.41	5.37
2	0.74	1.38	1.71	1.47	0.39	0.74	1.06	1.39
3	0.26	0.28	0.61	0.69	0.14	0.28	0.48	0.53
4	0.16	0.26	0.47	0.53	0.12	0.14	0.18	0.40
5	0.10	0.31	0.55	0.51	0.07	0.15	0.22	0.28
6	0.15	0.33	0.46	0.49	0.12	0.08	0.22	0.49
7	0.16	0.14	0.27	0.75	0.08	0.04	0.14	0.08

Source: Derived from Tables IV.10 to IV.25.

TABLE IV.28: MEAN RATIOS OF ACTUAL TO EXPECTED MIGRANTS FOR EACH ZONAL DISTANCE, IN AND OUT: ROXBURGH 1861, 1891, 1921 and 1961

Zonal distance	IN 1861	IN 1891	IN 1921	IN 1961	OUT 1861	OUT 1891	OUT 1921	OUT 1961
1	18.72	16.74	21.23	22.58	20.13	18.80	12.88	19.60
2	0.95	1.05	1.17	1.38	1.22	1.15	1.67	1.66
3	0.36	0.63	0.77	0.76	0.33	0.38	0.60	0.67
4	0.13	0.28	0.36	0.37	0.24	0.22	0.26	0.43
5	0.26	0.35	0.55	0.54	0.16	0.15	0.23	0.26
6	0.25	0.39	0.67	0.63	0.31	0.13	0.10	0.33
7	0.07	0.17	0.36	0.58	0.04	0.05	0.06	0.10

Source: Derived from Tables IV.10 to IV.25.

TABLE IV.29: MEAN RATIOS OF ACTUAL TO EXPECTED MIGRANTS FOR EACH ZONAL DISTANCE, IN AND OUT: SELKIRK 1861, 1891, 1921 and 1961

Zonal distance	IN 1861	IN 1891	IN 1921	IN 1961	OUT 1861	OUT 1891	OUT 1921	OUT 1961
1	11.17	14.54	14.34	14.21	11.97	10.71	11.99	16.15
2	1.07	1.15	1.42	0.99	0.43	1.21	0.96	0.78
3	0.11	0.23	0.44	0.49	0.11	0.31	0.48	0.45
4	0.07	0.17	0.41	0.54	0.20	0.23	0.21	0.41
5	0.11	0.26	0.44	0.68	0.10	0.15	0.30	0.36
6	0.12	0.26	0.43	0.74	0.23	0.11	0.09	0.37
7	0.01	0.07	0.30	0.84	0.00	0.04	0.13	0.13

Source: Derived from Tables IV.10 to IV.25.

TABLE IV.30: PRINCIPAL SOURCES AND DESTINATIONS OF MIGRANTS: BERWICK 1861, 1891, 1921 and 1961

	IN				OUT			
	1861	1891	1921	1961	1861	1891	1921	1961
1	Roxburgh	Roxburgh	Roxburgh	M'lothian	M'lothian	M'lothian	M'lothian	M'lothian
2	E.Lothian	M'lothian	M'lothian	Roxburgh	Roxburgh	Roxburgh	Roxburgh	Roxburgh
3	M'lothian	E.Lothian	E.Lothian	Selkirk	E.Lothian	Selkirk	E.Lothian	E.Lothian
4	Lanark	Fife	Lanark	E.Lothian	Lanark	Lanark	Lanark	Selkirk
5	Selkirk	Lanark	Selkirk	Lanark	Selkirk	E.Lothian	Selkirk	Lanark

Source: Census of Scotland — Birthplace Tables.

TABLE IV.31: PRINCIPAL SOURCES AND DESTINATIONS OF MIGRANTS: PEEBLES 1861, 1891, 1921 and 1961

	IN				OUT			
	1861	1891	1921	1961	1861	1891	1921	1961
1	Lanark	Lanark	M'lothian	M'lothian	M'lothian	M'lothian	M'lothian	M'lothian
2	M'lothian	M'lothian	Lanark	Lanark	Lanark	Lanark	Lanark	Lanark
3	Selkirk	Roxburgh	Selkirk	Selkirk	Selkirk	Selkirk	Selkirk	Selkirk
4	Roxburgh	Selkirk	Roxburgh	Roxburgh	Roxburgh	Roxburgh	Fife	Roxburgh
5	Dumfries	Dumfries	Dumfries	Dumfries	E.Lothian	E.Lothian	Roxburgh	Fife

Source: Census of Scotland — Birthplace Tables.

TABLE IV.32: PRINCIPAL SOURCES AND DESTINATIONS OF MIGRANTS: ROXBURGH 1861, 1891, 1921 and 1961

	IN				OUT			
	1861	1891	1921	1961	1861	1891	1921	1961
1	Berwick	Berwick	Berwick	M'lothian	M'lothian	Selkirk	M'lothian	M'lothian
2	Selkirk	Dumfries	M'lothian	Selkirk	Berwick	M'lothian	Selkirk	Selkirk
3	M'lothian	M'lothian	Selkirk	Berwick	Selkirk	Berwick	Berwick	Berwick
4	Dumfries	Selkirk	Dumfries	Lanark	Lanark	Lanark	Lanark	Lanark
5	Lanark	Lanark	Lanark	Dumfries	Dumfries	Dumfries	Dumfries	Dumfries

Source: Census of Scotland — Birthplace Tables.

TABLE IV.33: PRINCIPAL SOURCES AND DESTINATIONS OF MIGRANTS: SELKIRK 1861, 1891, 1921, 1961

	IN				OUT			
	1861	1891	1921	1961	1861	1891	1921	1961
1	Roxburgh	Roxburgh	Roxburgh	M'lothian	Roxburgh	Roxburgh	M'lothian	Roxburgh
2	M'lothian	Berwick	M'lothian	Roxburgh	M'lothian	M'lothian	Roxburgh	M'lothian
3	Berwick	M'lothian	Berwick	Lanark	Peebles	Lanark	Lanark	Berwick
4	Dumfries	Peebles	Lanark	Berwick	Berwick	Peebles	Peebles	Lanark
5	Peebles	Dumfries	Peebles	Peebles	Lanark	Berwick	Berwick	Peebles

Source: Census of Scotland — Birthplace Tables.

TABLE IV.34: SEX RATIOS OF IN-MIGRANTS AND OUT-MIGRANTS: BORDER COUNTIES, 1861, 1891, 1921, 1961

	1861		1891		1921		1961	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Berwick	111.2	114.7	116.4	108.8	119.7	116.4	110.8	141.8
Peebles	110.5	114.7	125.1	105.2	136.4	104.6	123.2	112.9
Roxburgh	87.4	113.2	131.4	103.9	135.9	107.9	116.2	118.3
Selkirk	110.0	107.0	103.2	106.7	133.3	105.8	128.3	111.0

Source: Calculated from Birthplace Tables of Census of Scotland.

TABLE IV.35: RESULTS OF MULTIPLE REGRESSION ANALYSES 1 AND 2

	Variable	Coefficient of correlation	Coefficient of determination	b value	Computed t value
1.					
X_1	% non-burghal	0.31	0.096	0.32	2.19
X_2	% aged 20-39	-0.27	0.073	-0.69	-0.56
X_3	% aged 65+	0.05	0.003	0.30	0.83
X_4	Females per 100 males	-0.02	0.001	0.66	1.50
X_5	Employed as % of labour force	0.08	0.006	0.61	1.38
2.					
X_6	% employed in agriculture	0.34	0.116	0.18	0.58
X_7	% employed in textiles	-0.33	0.109	-0.13	-0.46

TABLE V.1: TOTAL POPULATION: SPECIAL STUDY AREAS 1755-1970

	1755	1801	1811	1821	1831	1841	1851	1861	1871	1881	1891
Ettrick	397	445	440	485	530	525	477	454	434	397	414
Lilliesleaf	521	673	755	779	781	771	798	772	788	718	649
Swinton	494	875	866	919	971	1,095	994	964	996	964	847
Hawick	N/D	N/D	N/D	N/D	N/D	5,770	6,683	8,191	11,356	16,184	19,204

	1901	1911	1921	1931	1951	1961	1970
Et.	331	344	306	308	299	260	156
Li.	592	547	549	490	431	416	365*
Sw.	791	727	689	676	571	503	427‡
Ha.	17,303	16,877	16,353	17,059	16,717	16,206	16,304*

*this figure is for 1966. ‡estimated total based on sample survey.
Source: Censuses of Scotland and field survey.

TABLE V.2: PERCENTAGE AGED UNDER 15: SPECIAL STUDY AREAS 1861-1970

	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961	1970
Ettrick	36.3	36.2	32.5	36.0	27.8	29.1	22.5	N/D	N/D	N/D	25.0
Lilliesleaf	33.7	37.3	37.9	35.0	27.7	24.3	31.3	N/D	N/D	N/D	26.7
Swinton	36.4	38.7	36.7	33.3	29.3	26.8	27.0	N/D	N/D	N/D	22.4
Hawick	35.8	37.8	36.7	35.6	30.5	26.7	23.3	21.1	20.5	21.8	22.0*

* this figure is for 1966. N/D no data available.
Source: Calculated from Census of Scotland and field survey.

TABLE V.3: PERCENTAGE AGED 15 to 64: SPECIAL STUDY AREAS 1861-1970

	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961	1970
Ettrick	59.3	57.8	61.2	59.7	67.1	64.2	71.6	N/D	N/D	N/D	63.5
Lilliesleaf	60.4	56.9	54.7	57.5	62.5	65.8	59.9	N/D	N/D	N/D	57.3
Swinton	57.4	53.8	56.6	58.9	62.2	66.2	62.4	N/D	N/D	N/D	59.1
Hawick	60.7	58.2	59.7	60.1	64.5	67.1	68.7	70.3	66.3	63.7	63.2*

* this figure is for 1966. N/D no data available.
Source: Calculated from Census of Scotland and field survey.

TABLE V.4: PERCENTAGE AGED 65 AND OVER: SPECIAL STUDY AREAS 1861-1970

	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961	1970
Ettrick	4.4	6.0	6.3	4.3	5.1	6.7	5.9	N/D	N/D	N/D	11.5
Lilliesleaf	5.9	5.8	7.4	7.5	9.8	9.9	8.8	N/D	N/D	N/D	16.0
Swinton	6.2	7.5	6.6	7.8	8.5	7.0	10.6	N/D	N/D	N/D	18.5
Hawick	3.5	4.0	3.6	4.3	5.0	6.2	8.0	8.6	13.2	14.5	14.8*

* this figure is for 1966. N/D no data available.
Source: Calculated from Census of Scotland and field survey.

TABLE V.5: DEPENDENCY RATIO: SPECIAL STUDY AREAS 1861-1970

	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961	1970
Ettrick	68.8	72.9	63.4	67.5	49.1	55.7	39.7	N/D	N/D	N/D	57.6
Lilliesleaf	65.7	75.9	82.7	74.0	60.0	51.9	66.9	N/D	N/D	N/D	74.6
Swinton	74.3	85.8	76.6	69.7	60.8	51.1	60.2	N/D	N/D	N/D	69.2
Hawick	64.8	71.7	67.4	66.3	54.9	49.0	45.6	42.2	50.8	57.0	58.2*

* this figure is for 1966. N/D no data available.
Source: Calculations from Census of Scotland and field survey.

TABLE V.6: SEX RATIOS: SPECIAL STUDY AREAS 1801-1970

	1801	1811	1821	1831	1841	1851	1861	1871	1881	1891
Ettrick	119.2	122.2	94.0	88.6	99.6	91.6	110.2	104.7	100.5	104.9
Lilliesleaf	101.5	108.6	121.9	107.7	99.7	98.0	101.6	97.5	108.1	108.0
Swinton	113.4	112.8	98.1	111.1	99.1	106.7	108.7	111.9	102.5	111.2
Hawick	N/D	N/D	N/D	N/D	104.3	103.4	102.8	112.5	111.6	120.5

	1901	1911	1921	1931	1951	1961	1970
Et.	98.2	92.2	90.1	87.7	106.2	89.8	N/D
Li.	108.4	103.3	106.4	97.6	106.2	113.3	N/D
Sw.	116.1	109.5	106.3	101.2	113.9	99.6	N/D
Ha.	129.8	132.8	135.9	129.5	124.7	120.7	117.1*

* this figure is for 1966. N/D no data available.
Source: Census of Scotland and field survey.

TABLE V.7: OCCUPATIONAL COMPOSITION: SPECIAL STUDY AREAS 1861 and 1970

	ETTRICK				LILLIESLEAF				SWINTON			
	1861		1970		1861		1970		1861		1970	
	Number employed	% of total employed	Number employed	% of total employed	Number employed	% of total employed	Number employed	% of total employed	Number employed	% of total employed	Number employed	% of total employed
Agriculture	113	61.8	47	73.4	161	46.1	45	31.6	208	49.2	53	31.9
Personal service	48	26.3	1	1.6	99	28.4	15	10.5	84	19.8	24	14.5
Sales and commerce	4	2.2	3	4.7	18	5.2	19	13.3	24	5.6	22	13.3
Textiles	3	1.6	-	-	17	4.9	8	5.6	19	4.5	7	4.2
Other manufacturing	1	0.5	-	-	20	5.7	-	-	18	4.3	-	-
Professional	6	3.3	2	3.1	6	1.7	17	11.9	10	2.4	8	4.8
Transport	3	1.6	3	4.7	2	0.6	7	4.9	10	2.4	10	6.0
Clerical	-	-	-	-	-	-	6	4.2	-	-	12	7.2
Other and unclassified	5	2.7	8	12.5	26	7.4	26	18.0	50	11.8	30	18.1
TOTAL	183	100	64	100	349	100	143	100	423	100	166	100

Source: Calculated from enumeration returns of the Census of Scotland 1861 and field survey 1970.

TABLE V.8: PLACE OF WORK: SPECIAL STUDY AREAS 1970

ETTRICK			LILLIESLEAF			SWINTON		
	Persons	% of total		Persons	% of total		Persons	% of total
Ettrick Ph.	62	96.8	Lilliesleaf Ph.	88	61.5	Swinton Ph.	94	56.6
Hawick	1	1.6	Hawick	34	23.8	Duns	24	14.5
Kirkhope Ph.	1	1.6	Selkirk	4	2.8	Coldstream	16	9.6
			St. Boswells	4	2.8	Berwick-upon-Tweed	9	5.5
			Bowden Ph.	3	2.1	N'humberl'd	5	3.0
			Galashiels	2	1.4	Greenlaw Ph.	3	1.8
			Newtown St. Boswells	2	1.4	Chirnside Ph.	3	1.8
			Ancrum Ph.	2	1.4	Whitsome Ph.	2	1.2
			Edinburgh	1	0.7	Kelso	2	1.2
			Glasgow	1	0.7	Hutton Ph.	2	1.2
			Melrose	1	0.7	Edinburgh	2	1.2
			Peebles	1	0.7	Ladykirk Ph.	1	0.6
						Eccles Ph.	1	0.6
						Edrom Ph.	1	0.6
						Langholm (Dumfries)	1	0.6

Source: Field survey 1970.

TABLE V.9: IN-MIGRANTS FROM BIRTHPLACE DATA: SPECIAL STUDY AREAS 1861 and 1970

	ETTRICK				LILLIESLEAF				SWINTON				HAWICK	
	1861		1970		1861		1970		1861		1970		1966	
	Persons	% of total	Persons	% of total	Persons	% of total	Persons	% of total	Persons	% of total	Persons	% of total	Persons	% of total
Scotland	448	98.9	134	85.9	734	95.5	289	85.7	890	92.8	325	80.9	14,875	91.3
Border Counties	355	78.3	81	51.9	676	87.9	218	64.6	815	85.0	264	65.8	12,336	75.7
Ettrick Ph.	241	53.2	32	20.5					313	32.6	87	21.7		
Selkirk	50	11.0	17	10.9					452	47.2	147	36.7		
Dumfries	64	14.1	24	15.4					46	4.8	22	5.5		
Roxburgh	59	13.0	15	9.6					3	0.3	7	1.7		
Peebles	5	1.1	8	5.1					1	0.1	1	0.2		
Berwick	-	-	9	5.8										
Midlothian	12	2.6	4	2.6										
Rest of Scotland	17	3.8	25	16.0										
Lilliesleaf Ph.					304	39.5	79	23.4						
Roxburgh					271	35.2	98	29.1						
Berwick					39	5.1	19	5.6						
Selkirk					56	7.3	17	5.0						
Peebles					6	0.8	5	1.5						
Midlothian					22	2.9	23	6.8						
Dumfries					15	2.0	10	3.0						
Rest of Scotland					21	2.7	38	11.3						
Swinton Ph.									313	32.6	87	21.7		
Berwick									452	47.2	147	36.7		
Roxburgh									46	4.8	22	5.5		
Selkirk									3	0.3	7	1.7		
Peebles									1	0.1	1	0.2		
East Lothian									23	2.4	1	0.2		
Midlothian									21	2.2	17	4.2		
Rest of Scotland									31	3.2	43	10.7		
England	5	1.1	17	10.9	23	3.0	33	9.8	59	6.2	68	17.1	1,073	6.6
Ireland	-	-	2	1.3	11	1.4	1	0.3	8	0.8	-	-	60	0.4
Elsewhere	-	-	3	1.9	1	0.1	14	4.2	2	0.2	8	2.0	267	1.7
E. Central Scotland													1,067	6.5